Highway Engineering

Transportation Introduction

1. The main objective of transportation is?

a) Economical transport of goods

b) Economical transport of passengers

c) To generate revenue

d) Safe economical and efficient transport of goods and passengers

View Answer

Answer: d
Explanation: The main objective of a good transportation system is to provide safe economical, efficient transportation for the facility of passengers and transport of goods.

2. The factors influencing the cost of transportation are?

a) Supply

b) Demand

c) Both supply and demand

d) Cost of land

View Answer

Answer: c
Explanation: Increased productivity of various items such as agricultural and their distribution can lower the cost of products. The cost of transportation substantially reduces the prices.

3. Which is the most flexible type of transportation available?

a) Roadway

b) Railway

c) Waterway

d) Airway

View Answer

Answer: a
Explanation: The other 3 types of transport systems have to depend upon the roads to reach their destination point from the terminals that is railway station, harbours and airports.

4. The transportation system that requires a low initial investment among the following is?

a) Roadway

b) Railway

c) Harbour

d) Airport

View Answer

Answer: a
Explanation: The Roadway requires a cheaper initial investment when compared to the other 3 networks and it is the only system that provides equal facility for everyone in the society.

5. The PMGSY aims to connect all villages under population of 500 by which year?

a) 2003

b) 2004

c) 2005

d) 2007

View Answer

Answer: d
Explanation: The PMGSY aims to connect all the villages of population above 1000 by 2003 and population below 500 by 2007 it later became a part of bharat nirman programme.

6. The road density in India in km per 100 sq. km land area in 2008 is?

a) 100

b) 110

c) 129

d) 150

View Answer

Answer: c
Explanation: The road density is mean length of state roads per 100km2 so it is highly uneven in India.

7. The PMGSY was launched in the year?

a) 2000

b) 2002

c) 2003

d) 2004

View Answer

Answer: a
Explanation: The PMGSY was launched in the year 2000. The main aim of this programme was to connect the rural roads by the year 2007.

8. The current road length in India is in which position in the world?

a) 1st

b) 2nd

c) 3rd

d) 4th

View Answer

Answer: b
Explanation: The total roadway length in India is around5, 532,482km in march 2015 which is the 2nd largest network in the world.

9. The current highway development works in India are undertaken by?

a) NHAI

b) Govt. of India

c) State governments

d) NHDP

View Answer

Answer: a
Explanation: The highway works all across the country are undertaken by NHAI, It was formed in 1988 and it has mandate to follow all the NHDP (national highway development programme) which is implemented in phases.

10. The scope of highway engineering is divided into how many parts.

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The scope of highway engineering is divided into 2 parts called phases and details. In these phases overall review is given and in the details it is planned in detail.
Development of Road Construction, Highway Development in India

1. The main features of the roman road do not include the following?

a) They were built straight

b) They were strong

c) They excavated soft soil till hard strata was obtained

d) The total thickness was 0.75m to 1.2m

View Answer

Answer: b
Explanation: The romans built roads by excavating till the hard strata they were much stronger than required for animal drawn carts that time.

2. The tresaguet method of laying roads was developed in the year?

a) 1764

b) 1774

c) 1800

d) 1796

View Answer

Answer: a
Explanation: The tresaguet method was developed in 1764 AD in France after the fall of Roman Empire, in later years better methods were developed.

3. The method of providing a definite cross slope by varying thickness of foundations under roads was proposed by?

a) Tresauguet

b) Metcalf

c) Telford

d) Macadam

View Answer

Answer: c
Explanation: Telford insisted to provide a definitely varying cross slope by varying the thickness under the foundation of stones.

4. The cross slopes provided for drainage water under Macadam's construction road is?

a) 1 in 10

b) 1 in 20

c) 1 in 36

d) 1 in 40

View Answer

Answer: c
Explanation: The slope provided is 1 in 36, it was proposed by Macadam. He also completely changed the construction methods that were used earlier.

5. The broken stones that were used in construction of roads in macadam's construction were?

a) 10mm and 20mm

b) 20mm and 40mm

c) 30mm and 50mm

d) 50mm and 100mm

View Answer

Answer: d
Explanation: The bigger stones that were passing through 100mm sieve were used at the bottom and compacted and the smaller stones that were passing through 50mm were used at the top of the pavement.

6. The Indian Roads Congress was formed in the year?

a) 1928

b) 1934

c) 1929

d) 1930

View Answer

Answer: b
Explanation: The Indian Roads Congress was formed in the year 1934 after recommendation from the jayakar committee after a meeting in year 1928 and CRF was formed in 1929.

7. A research organisation that was formed for the research and development organisation works related to roads was?

a) Indian Roads Congress

b) Central Research Institute

c) Central road found

d) NHAI

View Answer

Answer: b
Explanation: The jayakar committee recommended that a research board should be formed for all research and development works related to roads and it was formed in 1950.

8. The first 20 year development plan is also called as?

a) Nagpur road plan

b) Lucknow road plan

c) Bombay road plan

d) Delhi road plan

View Answer

Answer: a
Explanation: The First 20 year development plan conference was held in Nagpur,hence it is also called as Nagpur road plan, second was held in Mumbai and third in Lucknow.

9. The east west corridor of National highway connects which of the following cities?

a) Delhi-Bombay

b) Bombay-Madras

c) Kolkata-Vadodara

d) Porbandar- Silichar

View Answer

Answer: d
Explanation: The Phase II of NHDP consists of linking the east west corridor from Porbandar in Gujarat to Silichar in Assam.

10. Primary system of roads consists of?

a) National highway

b) Expressway

c) National highway and Expressway

d) State highway

View Answer

Answer: c
Explanation: The Primary system consists of National Highway and expressway. The secondary system consists of State highway and other Major District Roads.

11. The 4th 20 year road development plan aims for vision in which year?

a) 2021

b) 2022

c) 2024

d) 2025

View Answer

Answer: a
Explanation: The 4th 20 year development plans aims for vision 2021 .but however it was well before 2000.

12. The National Highway network should be expanded so that no part of a country is more than 50km away from NH is policy of which twenty year road development plan?

a) 1st 20 year road development plan

b) 2nd 20 year road development plan

c) 3rd 20 year road development plan

d) 4th 20 year road development plan

View Answer

Answer: c
Explanation: In the 3rd year road development plan it was proposed that the national highway should be expanded such that no part of nation should be 50km away from a national highway.
Highway Planning, Road Classification & Patterns

1. The phases of highway planning do not include the following

a) Assessment of road length requirement

b) Preparation of master plan

c) Showing the phasing of a plan in five year plan

d) Financing

View Answer

Answer d:
Explanation: Financing of the highway is done after the planning of highway after getting approval from the government, before the assessment, preparation and DPR are prepared.

2. Which type of roads can be utilized during monsoon?

a) Unpaved roads

b) Gravel roads

c) Fair weather roads

d) Bituminous roads

View Answer

Answer: d
Explanation: Bituminous roads are convenient to use compared to the other roads because they can easily drain off the water and are comfortable to use during rainy season.

3. The Nagpur plan classified the roads based on

a) Location

b) Function

c) Location and function

d) Annual daily traffic

View Answer

Answer: c
Explanation: The Nagpur plan classified the roads based on location and function into 5 categories namely National Highway, State Highway, Major District Road, Other District Road, Village Road.

4. The roads that connect the district headquarters to important city of other state is called

a) National Highway

b) State Highway

c) Major district road

d) Other district road

View Answer

Answer: b
Explanation: A State Highway is a highway that connects the district headquarters to other important cities in another state.

5. The arterial roads are a classification of which type of roads?

a) Rural roads

b) Urban Rods

c) National highway

d) State highway

View Answer

Answer: b
Explanation: Urban roads are classified into Arterial roads, Sub arterial roads, Collector streets and Local streets.

6. The rectangular pattern of roads has been adopted in which Indian city?

a) New Delhi

b) Chandigarh

c) Hyderabad

d) Mumbai

View Answer

Answer: b
Explanation: Chandigarh city was planned by assuming rectangular pattern. But by this pattern operation of traffic has been a problem.

7. The Nagpur plan formulae assumed which type of pattern?

a) Star and grid

b) Star and circular

c) Hexagonal

d) Circular

View Answer

Answer: a
Explanation: The Nagpur plan assumed star and grid pattern in which it assumed to connect all the nearby important cities and villages to the National capital.

8. The Nagpur plan conference was held in which year?

a) 1941

b) 1942

c) 1943

d) 1947

View Answer

Answer: c
Explanation: The Nagpur plan conference was held in 1943 which was the first 20 year development plan. The main target of the plan was to achieve 16km road density per 100sq.km.

9. The highway research Board was set up in the year

a) 1947

b) 1953

c) 1963

d) 1973

View Answer

Answer: d
Explanation: The highway research board was set up in the year 1973 by IRC to give good guidance for road development in India.

10. The second 20 year development plan conference was held in which city?

a) Nagpur

b) Bombay

c) Madras

d) Lucknow

View Answer

Answer: b
Explanation: The second 20 year development plan conference was held in Bombay,
Their target was to achieve road length of 32km but they achieved 34.8km.

Planning Surveys and Interpretation

1. Planning is based on

a) Factual data

b) Analysis

c) Scientific data

d) Factual data and analysis

View Answer

Answer: d
Explanation: Planning based on factual data and analysis may be considered scientific and sound.

2. The planning survey consists of how many numbers of studies?

a) One

b) Two

C) Three

d) Four

View Answer

Answer: d
Explanation: The planning survey consists of the four studies namely
Economic studies
Financial studies
Traffic studies
Engineering studies.

3. The estimates are studied in which type of studies?

a) Economic studies

b) Financial studies

c) Traffic studies

d) Engineering studies

View Answer

Answer: a
Explanation: The details to be collected during economic studies are useful in estimating the requirements, cost involved in the project and economic justification.

4. The revenue from road transport sector is studied in which type of studies?

a) Economic

b) Financial

c) Traffic

d) Engineering

View Answer

Answer: b
Explanation: The sources of income, excise duty, registration charges and tax all are studied in financial studies only.

5. The accident cost analysis is estimated by conducting

a) Origin and destination

b) Traffic survey

c) Transportation facilities

d) Geometric design

View Answer

Answer: b
Explanation: The accident cost analysis, trends in road accidents and facilities all are estimated by conducting traffic survey, origin and destination studies are for trips and geometry for facility.

6. The topographic survey is conducted to estimate which of the following characteristics?

a) Engineering

b) Traffic

c) Financial

d) Soil

View Answer

Answer: a
Explanation: The engineering studies are conducted to assess topography, soil, location and classification of existing roads and other developments.

7. The master plan may not be prepared for

a) Village

b) City

c) State

d) Country

View Answer

Answer: a
Explanation: The master plan is prepared after interpretation of small plans in different phases. It may be prepared for a city, district ,state or even country.

8. The determination of optimum length is based on

a) Saturation system

b) Geometric design

c) Type of highway

d) Length of highway

View Answer

Answer: a
Explanation: The determination of optimum length is based on saturation system based on U.S system of highway planning.

9. The final step after fixing the optimum length of the road

a) Financing

b) Construction

c) Phasing

d) Preparation of master plan

View Answer

Answer: c
Explanation: The final step after fixing the optimum length is phasing of the road program before the construction, after financing and master plan the construction is under taken.

10. The utility unit as per saturation system for a population of less 1001 to 2000 is

a) 0.25

b) 0.50

c) 1.00

d) 2.00

View Answer

Answer: c
Explanation: The utility unit is a factor that is used to decide the priority given to the users for optimum utilization of road and it is 1.00 for a population of 1001-2000, it increases based on the population.
Highway Planning in India

1. As per the Nagpur plan the un-surfaced roads were meant for

a) National highway

b) State highway

c) Major district road

d) Other district road and village road

View Answer

Answer: d
Explanation: The Nagpur plan classified the roads into two categories, category one was meant for national highway, state highway and major district road. The un-surfaced roads were meant for other district roads and village roads.

2. The total length of the first category roads was calculated by adding up the sum of

a) NH+SH+MDR

b) NH+SH

c) SH*2

d) NH+2SH+MDR

View Answer

Answer: a
Explanation: The category one type of roads consisted of national highway, state highway and major district roads. The length was calculated by adding all the three types of roads.

3. What was the development allowance assumed in the Nagpur plan?

a) 10%

b) 20%

c) 15%

d) 25%

View Answer

Answer: c
Explanation: The development allowance was assumed as 15% and in this plan the length of the railway track also was deducted, this was not like the previous 20 year plan.

4. During the development of the roads maximum priority is given to which type of road?

a) National highway

b) State highway

c) Major district road

d) Village road

View Answer

Answer: a
Explanation: The maximum priority during construction of any road is given to national highway as they connect across length and breadth of the entire country.

5. The total length of highways in 2001 in km was

a) 56000

b) 56756

c) 56750

d) 57000

View Answer

Answer: d
Explanation: The total length of NH achieved in 2001 was 5700km against a planned length of 66000km.

6. The total area of a state is 2500km .calculate the length of MDR

a) 100 km

b) 200 km

c) 300 km

d) 400 km

View Answer

Answer: b
Explanation: Length of MDR=Area of the state/12.5=2500/12.5=200km.

7. The tertiary road system consists of

a) National highway

b) State highway

c) Major district road

d) Other district road and village road

View Answer

Answer: d
Explanation: As per the 2nd 20 year road development plan the primary system consist of national highway and state highway. The secondary system consists of state highway .the tertiary system consists of other district road and village road.
advertisement

8. The ‘rural road development plan: Vision 2025’ aims to provide basic access to villages in how many phases?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The Vision: 2025 aims at providing accessible facilities to villages in 3 phases by giving priority to the population in the village.

9. Expressways should be constructed along

a) Congested cities

b) Major traffic corridors

c) Along with highways

d) Small cities

View Answer

Answer: b
Explanation: Expressways should be constructed along major traffic corridors for convenience of passengers to travel safely and comfortably.

10. The maximum number of cities and towns are connected by which type of highway

a) National highway

b) State highway

c) Major district road

d) Village road

View Answer

Answer: a
Explanation: The national highway connects most of the cities and towns in the country.
State highway connects in the state, village road in villages and other roads connect the remote areas.
Highway Alignment

1. The changes in gradient and vertical curve are covered under which type of alignment?

a) Horizontal alignment

b) Vertical alignment

c) Geometric design

d) Highway specifications

View Answer

Answer: b
Explanation: The changes in gradient and vertical curve are covered under the vertical alignment, whereas the remaining three are covered under horizontal alignment.

2. The improper alignment of road will not result in

a) Increase of construction cost

b) Increase of maintenance cost

c) Increase of population

d) Increase of accidents

View Answer

Answer: c
Explanation: The increase of population does not depend on the alignment of the road, whereas improper construction and maintenance lead to accidents.

3. The basic requirement of alignment should be

a) Short

b) Easy

c) Safe

d) Short, easy, safe and economical

View Answer

Answer: d
Explanation: The alignment of the road should be short, safe, easy and economical for users and engineers.

4. The economical option during the construction of a road around a hill is

a) Cut the hill

b) Provide a tunnel

c) Provide a road around the hill

d) Look for other alternative approach

View Answer

Answer: c
Explanation: The most economical option is to provide a road around the hill. In this alternative approach is not advisable as it has to pass either through the hill or nearby the hill.

5. Obligatory points through which the alignment should not pass are

a) Religious structure and costly structures

b) Intermediate towns

c) Important cities

d) Important places of worship

View Answer

Answer: a
Explanation: The obligatory points through which alignment should not pas include religious structures and costly structures because destroying them would require a lot of compensation.

6. The desire lines are prepared for the study of

a) Traffic flow

b) Origin and destination

c) Growth of traffic in future

d) Anticipated traffic flow

View Answer

Answer: a
Explanation: The desire lines are lines which study the traffic flow from origin and destination.

7. Which of the following types of roads are most preferred for highways?

a) Cement concrete roads

b) Gravel roads

c) Bituminous roads

d) Unpaved surfaces

View Answer

Answer: c
Explanation: The most preferred type of road is bituminous roads. They are cheap for initial construction when compared to other type of surfaced roads.

8. The stability of slopes is considered while designing

a) National highway

b) State highway

c) Hill roads

d) District roads

View Answer

Answer: c
Explanation: The slope stability is important during design of hill roads ,because it may have a danger of landslides.

9. The coefficient of lateral friction as recommended by IRC is

a) 0.15

b) 0.40

c) 0.35

d) 0.30

View Answer

Answer: a
Explanation: The coefficient of lateral friction recommended by IRC is 0.15 and it lies between 0.3-0.4 for longitudinal friction.

10. The resisting length should be kept

a) minimum

b) Maximum

c) Depends on gradient

d) Depends on rise and fall

View Answer

Answer: a
Explanation: The resisting length should be kept as low as possible for gradient purposes, if it is maximum then there will be a problem with the gradient.

Engineering Surveys for Highway Alignment

1. The surveys of highway alignment are completed in how many stages?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: d
Explanation: The surveys are completed in 4 stages namely map study, reconnaissance, preliminary survey and detailed survey.

2. The maps in India related to topography are prepared by

a) Geological survey of India

b) Survey of India

c) NHAI

d) GOI

View Answer

Answer: b
Explanation: All the maps related to topography in India are prepared by survey of India, NHAI is for highway alignment and geological survey of India for any rocks exploration, government of India is the finance aid for all.

3. The survey in which details are covered roughly but not accurately is called

a) Reconnaissance

b) Rough survey

c) Map study

d) Detailed study

View Answer

Answer: a
Explanation: The reconnaissance survey consists of studying the details in the field roughly which are not covered in the map study.

4. The soil survey is conducted in which of the following survey?

a) Preliminary survey

b) Reconnaissance survey

c) Map study

d) Topography study

View Answer

Answer: a
Explanation: The preliminary survey consists of collecting topographical data, soil survey and other data, in reconnaissance survey rough survey is done, map study is for plan.

5. A closed loop used for survey purpose is called

a) Open traverse

b) Closed traverse

c) Primary traverse

d) Secondary traverse

View Answer

Answer: b
Explanation: A traverse is a closed loop used for survey purpose, if it is open then it is called as open traverse.

6. Expand GPS

a) Global position satellite

b) Global perception satellite

c) Global position system

d) Geographical position system

View Answer

Answer: c
Explanation: GPS –Global position system is a modern technique used for survey.GIS is also used for the weather report and other applications.

7. The intervals for levelling work in rolling terrain are taken as

a) 50m

b) 30 m

c) 45 m

d) 40 m

View Answer

Answer: a
Explanation: In the rolling terrain the interval is considered as 50m and in hilly terrain is taken as 30m.

8. The first step in preliminary survey is

a) Primary traverse

b) Map study

c) Detailed survey

d) Detailed project report

View Answer

Answer: a
Explanation: The first step in preliminary survey is to establish primary traverse followed by survey and detailed project report.

9. The surface thickness of the pavement is decided based on

a) HFL

b) MFL

c) MSL

d) HFL and MSL

View Answer

Answer: a
Explanation: The HFL is the height till which water raised during recent floods, to avoid the flooding of roads they are always kept above HFL.

10. The key map size should not exceed

a) 20*22 cm

b) 32*20 cm

c) 32*32 cm

d) 20*32 cm

View Answer

Answer: a
Explanation: The key map shows the proposed site and important places, the key map should not exceed 22*20cm in size

Drawings and Report

1. The index map shows

a) Topography

b) Soil

c) Area of the site

d) Plan

View Answer

Answer: a
Explanation: Index map is used for general topography. They are usually prepared in 32*20 cm map.

2. Detailed size drawings are prepared in which sheet?

a) A1

b) A2

c) A3

d) A4

View Answer

Answer: b
Explanation: The detailed plans of drawings are prepared in A2 sheets. They are usually 60*42cm in size.

3. The cross sections should be drawn for every

a) 10m

b) 20m

c) 50m

d) 100m

View Answer

Answer: d
Explanation: The cross section should be drawn for every 100m or wherever there is an abrupt change in the level.

4. The approximate cost of construction evaluated for the project is called

a) Project report

b) Project feasibility

c) Estimate

d) Detailed project report

View Answer

Answer: c
Explanation: The approximate cost of project before the construction is called as an estimate.

5. The report that includes all the works including soil, bridges, topography, material studies and drainage

studies is called as

a) Feasibility report

b) Detailed project report

c) Survey report

d) Primary report

View Answer

Answer: Detailed project report or DPR is the report that is created after all the surveys and estimates have been prepared for a final review.

6. The planning, design and construction of either a network of new roads or road link is called

a) Highway project

b) Highway estimate

c) Highway interlinking

d) Highway design

View Answer

Answer: a
Explanation: The highway project includes planning, designing and execution of new roads or providing links between existing roads, design is for geometry and interlinking word is not so appropriate and estimate is prepared for every highway.

7. Highway should be planned for

a) Present requirements

b) Traffic developments

c) Traffic studies

d) Present requirements and future requirements

View Answer

Answer: d
Explanation: A highway should be planned such that the present and future requirements of the highway are satisfied.

8. The New highway project is divided into how many stages?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The new highway project is divided into (i) Selection of route, alignment and geometric design. (ii) Collection of materials (iii) Construction stages including quality control.
Highway Projects

1. A part of land that is acquired during initial stages of construction for future expansion is called

a) Kerb

b) Footpath

c) Right of way

d) Camber

View Answer

Answer: c
Explanation: Right of way is a part occupied either by the highway or railway by paying some compensation to the owners for future expansion which may have kerb, footpath and camber.

2. Which method is recommended by IRC for flexible pavements?

a) CBR

b) IRC 6

c) IRC 21

d) IRC 58

View Answer

Answer: a
Explanation: The CBR method is recommended by IRC because it gives very reliable accuracy as the test depends on soil characteristics, IRC 6,21 and 58 are the code books for various pavement design.

3. Inspection of site is done in which survey?

a) Preliminary

b) Secondary

c) Reconnaissance

d) Final report

View Answer

Answer: c
Explanation: The reconnaissance survey includes the inspection of site, soil, material and construction materials.

4. Road roughness is tested by

a) Bump integrator

b) RTRRMS

c) GIS

d) UI

View Answer

Answer: a
Explanation: The road roughness is tested by bump integrator which is measured in mm/km and is classified into various types based on unevenness index value.

5. To minimize the cost of the project the most suitable method is

a) CPM

b) PERT

c) CPM and PERT

d) Normal distribution curves

View Answer

Answer: a
Explanation: CPM is mostly used in major projects, CPM is cost oriented whereas PERT is useful only for research purposes, normal distribution curve is followed by CPM.

6. The highly flooded areas should be re aligned by

a) Providing additional thickness of pavement

b) Providing suitable layers of pavement

c) Providing appropriate camber

d) Providing higher geometric specifications

View Answer

Answer: a
Explanation: The existing road can be re aligned only by providing a thickness of pavement, because the camber cannot be changed, so additional thickness is the only option available.

7. Embankments are provided on highway near

a) Important cities

b) Religious structure

c) Railway tracks and highly flooded area

d) Costly structures

View Answer

Answer: c
Explanation: The embankments are provided mostly near the highly flooded area, embankments near the railway tracks may be provided or may not be required it depends on the railway track.

8. The drawing for re alignment shows the existing road, proposed re alignment, contours and all other features

it is called as

a) Plan

b) Elevation

c) Cross section

d) Longitudinal section

View Answer

Answer: a
Explanation: The plan shows all the above features, whereas the sections show existing roads, ground elevation, beginning and end of transition curves.

Preparation of Detailed Project Report

1. The DPR consists of how many components?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The DPR consists of report, estimate and drawing making it three components.

2. The first step in the detail checklist of DPR is

a) Executive summary

b) Background

c) Roadway features

d) General details of the project

View Answer

Answer: a
Explanation: The executive summary is the details that are prepared after the field work in the site has been completed.

3. The name of the work and project details is managed under which category of DPR?

a) Executive summary

b) Background

c) Roadway details

d) General details

View Answer

Answer: b
Explanation: In the background of the project name, scope of service, data source, importance and economics of the project are managed.

4. The roadway features include the study of

a) Accidental analysis

b) Geometric design

c) Route alignment

d) Safety

View Answer

Answer: c
Explanation: The roadway features are studied for route selection, route alignment, environmental factors, cross section elements, traffic studies.

5. The final step in the specifications and design of roadway elements is

a) Specifications

b) Design elements

c) Geometric design

d) Safety and audit of the design elements

View Answer

Answer: d
Explanation: After all the design requirements are calculated and if they are finalized the last step is to check the safety of the design elements.

6. Which of the following is not a structure constructed for drainage purposes?

a) Aqueduct

b) Syphon aqueduct

c) Level crossing

d) Pitot tube

View Answer

Answer: d
Explanation: A pitot tube is an instrument which is used to measure the velocity of water in rivers and streams.

7. The strength of the materials can be checked by

a) Visual inspection

b) Quality control

c) By asking the manufacturer

d) By referring to various codes

View Answer

Answer: b
Explanation: The materials should always be tested in laboratory for accurate and exact results quality check should always be conducted.

8. For small projects which type of method is used for calculation of project time?

a) Milestone chart

b) Bar chart

c) PERT

d) CPM

View Answer

Answer: b
Explanation: For small projects the completion time may be evaluated by bar chart, milestone chart may be used when all the critical activities are required.

9. Which of the following is prepared first during estimate?

a) Schedule of rates

b) Rate analysis

c) Detailed cost estimate

d) Detailed project

View Answer

Answer: a
Explanation: The first step in the preparation of estimate is schedule of rates followed by rate analysis and detailed cost estimate.

10. The site amenities are covered under which of the items of DPR?

a) Background

b) Abstract

c) Miscellaneous

d) Estimate

View Answer

Answer: c
Explanation: The site amenities, diversion of roads, road side plantation and other facilities are covered under miscellaneous items, background and abstract are the important aspects, estimate are also very important.

Geometric Design of Highways

1. The design of horizontal and vertical alignments, super elevation, gradient is worst affected by

a) Length of vehicle

b) Width of vehicle

c) Speed of vehicle

d) Height of vehicle

View Answer

Answer: c
Explanation: All the geometric design features are worst affected by velocity of the vehicle only.

2. The most raised portion of the pavement is called

a) Super elevation

b) Camber

c) Crown

d) Kerb

View Answer

Answer: c
Explanation: The most elevated or the highest portion of a pavement is called as a crown, whereas camber is the portion that is raised for drainage purposes.

3. The extra width of pavement is provided on

a) Horizontal curve

b) Width of pavement

c) Length of pavement

d) Super elevation

View Answer

Answer: a
Explanation: Extra width of pavement is provided on horizontal curve to avoid the skidding, if the vehicle negotiates the curve then the centrifugal force will act towards outside and there is a chance of skidding, to avoid this extra width is provided.

4. Transition curve is introduced in

a) Horizontal curve

b) Circular curve

c) Between horizontal curve and circular curve

d) Vertical curve

View Answer

Answer: c
Explanation: A transition curve is introduced between horizontal curve and circular curve, the transition curve slowly introduces the centrifugal acceleration to avoid the danger of skidding.

5. The most important factor that is required for road geometrics is

a) SSD

b) OSD

c) ISD

d) Speed of vehicle

View Answer

Answer: d
Explanation: The road user characteristics, traffic and vehicular characteristics mostly influence the road geometric design but the most important factor is speed of vehicle.

6. The design speed of NH on a cross slope of up to 10% is

a) 100kmph

b) 80kmph

c) 60kmph

d) 50kmph

View Answer

Answer: a
Explanation: The ruling speed up to a cross slope of 10% is 100kmph; it decreases with increase in increase of cross slope.

7. A part of pavement raised with respect to one side keeping the other side constant is called

a) Footpath

b) Kerb

c) Super elevation

d) Camber

View Answer

Answer: c
Explanation: The super elevation is a portion of pavement raised on outer edge with respect to inner edge or both edges raised with respect to centre.

8. The main purpose of providing camber is

a) To collect storm water

b) To maintain equilibrium

c) To follow IRC specifications

d) To follow geometric specifications

View Answer

Answer: a
Explanation: During rainy season the roads are usually flooded with water so to keep the pavement dry they have to be drained off so the road is provided with a camber.

9. The legal axle load of the design vehicle used in India is

a) 1.6 tonne

b) 8.2 tonne

c) 16.2 tonne

d) 32.4 tonne

View Answer

Answer: b
Explanation: The legal axle load used for design of pavements is 8.2 tonnes; usually they are expressed in MSA (million standard axles).

10. In India the type of traffic assumed to design pavements is

a) Low traffic

b) Heavy traffic

c) Mixed traffic flow

d) Very low traffic

View Answer

Answer: c
Explanation: In India generally there is always a mixed traffic flow except during midnight hours and early morning hours, so the designer has to assume mixed traffic flow only.

Highway Cross Section Elements – 1

1. The braking efficiency mainly depends on

a) Sight distance

b) PIEV theory

c) Friction

d) Length of the curve

View Answer

Answer: c
Explanation: The braking efficiency mainly depends on friction and speed of the vehicle, if the speed of vehicle is more, then braking efficiency will be less.

2. The braking efficiency for a vehicle moving with a speed of 18kmph, having a lag distance of 14m and coefficient of longitudinal friction is 0.36

a) 25.28%

b) 25.4%

c) 25.6%

d) 25.8%

View Answer

Answer: a
Explanation: Braking efficiency=100*f'/f
$f'=v^2/2gL$
f'=5*5/2*9.81*14
f'=0.09
=100*0.09/0.36
=25.28%

3. If the longitude coefficient of friction is 0.4, then the resultant retardation in m/sec^2 as per IRC will be

a) 3.93

b) 4.00

c) 4.01

d) 4.02

View Answer

Answer: a
Explanation: The deceleration of the vehicle mainly depends on the speed of vehicle and coefficient of friction; however IRC has calculated the average value as 3.93 m/sec^2 from equations of motion.

4. The unevenness index for a good pavement surface of high speed should be

a) 1500mm/km

b) 2500mm/km

c) 3500mm/km

d) 4500mm/km

View Answer

Answer: a
Explanation: The unevenness index for a good pavement surface should be kept as low as possible, because they may cause discomfort to passengers and increase the rate of accidents.

5. If the camber is x%, then cross slope is

a) 100X

b) 200/X

c) X/100

d) 100+X

View Answer

Answer: c
Explanation: The cross slope is generally expressed in n in 100 terms, so the cross slope is X/100.

6. The camber required depends on

a) Type of pavement

b) Rainfall

c) Type of pavement and rainfall

d) Rainfall characteristics

View Answer

Answer: c
Explanation: The camber to be provided changes depending on the type of rainfall and the type of pavement surface.

7. The minimum camber required in heavy rainfall area for bituminous roads as per IRC is

a) 1%

b) 2.5%

c) 2.7%

d) 3%

View Answer

Answer: b
Explanation: The minimum camber to be provided in heavy rainfall areas is 2.5%. If there is heavy flood then provision of this camber will be sufficient to drain of flood water.

8. The camber is not provided in which of the following shape

a) Straight

b) Parabolic

c) Combination of straight and parabolic

d) Circular

View Answer

Answer: d
Explanation: The camber is a raised portion, it has to be either straight or parabolic no other shape of camber is possible.

9. The rise of crown for a pavement of 7m wide having 1 in 50 slopes with respect to edges is

a) 0.14

b) 0.07

c) 0.09

d) 0.11

View Answer

Answer: b
Explanation: Width of pavement=7m
Rise of crown=7/2*1/50=7/100=0.07.

10. The equation of parabolic camber is given by

a) Y=x/a

b) $Y=x^2/a$

c) $Y=x^3/a$

d) $Y=ax^2$

View Answer

Answer: b
Explanation: The general equation is expressed as $y=x^2/a$,where a=nw/2 for a pavement width of w and cross slope of 1 in n.

Highway Cross Section Elements – 2

1. The minimum width of carriage way in urban roads is

a) 2.5m

b) 3.0m

c) 3.5m

d) 3.75m

View Answer

Answer: d
Explanation: The minimum width of carriage way is 3.75m in urban roads; this value may be less in towns and villages depending on the requirement like 3.5 m.

2. A median is also called as

a) Traffic separator

b) Traffic junction

c) Traffic check post

d) Traffic flow

View Answer

Answer: a
Explanation: The median may be a physical marking, divided area or protected by physical structure to avoid head on collisions.

3. The desirable width as per IRC for median on rural roads is

a) 3m

b) 5m

c) 8m

d) 14m

View Answer

Answer: b
Explanation: The desirable width is 5m on rural roads which can be reduced to 3m if there is a restriction of land.

4. The height of low kerb is kept about

a) 50mm

b) 75mm

c) 100mm

d) 200mm

View Answer

Answer: c
Explanation: A kerb is a structure used to separate pavement and median, pavement and shoulder, pavement and footpath. In low kerb height is restricted to 100mm only.

5. The minimum shoulder width recommended by IRC is

a) 1.0m

b) 1.5m

c) 2.0m

d) 2.5m

View Answer

Answer: d
Explanation: The minimum shoulder width is 2.5m recommended by IRC, the shoulder provides lateral stability and act as emergency lanes for vehicles.

6. The width of drive way should be

a) Minimum

b) Maximum

c) Intermediate

d) Maximum or minimum

View Answer

Answer: a
Explanation: The width of drive way should be kept as minimum as possible to reduce the crossing distance of pedestrians.

7. A road running parallel to highway for some selected areas with grade separator are called

a) Footage road

b) Urban road

c) Frontage road

d) Parallel highway

View Answer

Answer: c
Explanation: A frontage road is a road that is mainly laid in urban areas to connect some parts of the city without disturbing the highway.

8. The width of formation is calculated by adding

a) Sum of width of pavements

b) Width of pavement+ separators

c) Width of pavement + separators +shoulders

d) Width of pavement + separator+ shoulders + side drains

View Answer

Answer: c
Explanation: The width of formation or roadway is the sum of pavements, shoulders and separator excluding side drains.

9. The boundary till which building activities are prohibited is called

a) Right of way

b) Boundary line

c) Building line

d) Control line

View Answer

Answer: c
Explanation: The space left over for future expansion of roads without allowing any building activities is called as building line.

10. The normal width recommended in rural areas by IRC for national highway is

a) 45m

b) 29 m

c) 60 m

d) 25 m

View Answer

Answer: a
Explanation: The average width required for national highway is 45m,it may be between 30m-60m for plain and rolling terrains.

Sight Distance

1. The length visible to driver at any instance of time is called

a) Sight distance

b) Visibility limit

c) Head light distance

d) Overtaking sight distance

View Answer

Answer: a
Explanation: The length of the road that is visible to the driver at any time is called sight distance, in night visibility it is headlight sight distance and in zone which it can be overtaken is called overtaking sight distance.

2. The stopping sight distance of a vehicle moving with 45kmph and having a coefficient of friction as 0.4 is

a) 48m

b) 49m

c) 50m

d) 51m

View Answer

Answer: d
Explanation: $SSD=0.278vt+v^2/254f$
$SSD=0.278*45*2.5+45^2/ (254*0.4)$
SSD=51m.

3. The stopping sight distance does not depend on

a) Break reaction time

b) Speed of vehicle

c) Length of vehicle

d) Friction

View Answer

Answer: c
Explanation: $SSD=0.278vt+v^2/ (254f)$
In this equation t is the reaction time taken by driver for stopping the vehicle, v is the speed of the vehicle and f is the coefficient of friction, so the SSD is independent of length of the vehicle.

4. The SSD is based on

a) Speed of vehicle

b) PIEV theory

c) Voluntary action of brain

d) Reflex action of brain

View Answer

Answer: b
Explanation: The SSD is based on PIEV theory, it is the theory that estimates the time taken to perceive and react.

5. The reaction time considered in SSD is

a) 1.5 sec

b) 2 sec

c) 2.5 sec

d) 3 sec

View Answer

Answer: c
Explanation: The reaction time considered in SSD unless and until specified is 2.5 sec; it is based on PIEV theory.

6. The desirable relationship between OSD and length of overtaking zone is

a) Length of overtaking zone=OSD

b) Length of overtaking zone=2 OSD

c) Length of overtaking zone = 3 OSD

d) Length of overtaking zone = 5 OSD

View Answer

Answer: d
Explanation: The minimum length of overtaking zone is 3 times of OSD, but desirable is 5 times of OSD.

7. If the speed of overtaken vehicle is 80Kmph, then the design speed is

a) 80kmph

b) 96kmph

c) 100kmph

d) 106kmph

View Answer

Answer: c
Explanation: Vb=V-16
V=Vb+16
V=80+16=96Kmph.

8. If the speed of overtaken vehicle is 50kmph then spacing of vehicles is

a) 10m

b) 12m

c) 14m

d) 16m

View Answer

Answer: d
Explanation: The spacing of vehicles is given by S=0.2Vb+6
S=0.2*50+6
S=16m.

9. The reaction time of a driver assumed in OSD is

a) 1 sec

b) 2 sec

c) 2.5sec

d) 3 sec

View Answer

Answer: b
Explanation: The reaction time assumed is 2 sec which is less than time taken in SSD because here the driver does not need to perceive and react so this time is less than time taken in SSD.

10. The height of the driver above the road level is assumed as

a) 1.1m

b) 1.2 m

c) 1.5 m

d) 1.6m

View Answer

Answer: b
Explanation: The height of the driver assumed is 1.2m which is till the eye level; this is assumed for clear vision in night.

11. The relationship between SSD and ISD is

a) SSD= ISD

b) SSD=1.5 SSD

c) SSD= ISD+ OSD

d) SSD= 2 ISD

View Answer

Answer: d
Explanation: The ISD is the intermediate sight distance which is provided when there is no possibility of providing OSD as far as possible the roads are provided with SSD= 2 ISD relationship.

12. The sight distance recommended by IRC for 50kmph speed is

a) 100m

b) 110m

c) 120m

d) 200m

View Answer

Answer: b
Explanation: IRC recommends a sight distance of 110m for a speed of 50kmph, 180m for a speed of 80kmph and 220m for a speed of 100kmph.
Design of Horizontal Alignment – 1

1. The degree if curve is central angle subtended by an arc of length

a) 20m

b) 25m

c) 30m

d) 35m

View Answer

Answer: c
Explanation: The relation between degree and radius of circular curve is RDπ/180=30.

2. The ratio between centrifugal force and weight of the vehicle is called

a) Impact factor

b) Impact ratio

c) Centrifugal factor

d) Centrifugal impulse

View Answer

Answer: a
Explanation: The relationship between centrifugal force and weight of the vehicle is called impact factor or centrifugal ratio.

3. Which of the following is equal to super elevation?

a) Sinθ

b) Cosθ

c) Tanθ

d) Secθ

View Answer

Answer: c
Explanation: The transverse inclination to the pavement surface is called as super elevation or cant banking which is equal to tanθ.

4. If the radius of a horizontal curve is 120m, then calculate the safe allowable speed

a) 50kmph

b) 60kmph

c) 70kmph

d) 80kmph

View Answer

Answer: b
Explanation: The safe allowable speed is Va= √ (27.94R)
Va=√ (27.94*120)
Va=60kmph

5. If the super elevation of the highway provided is zero, then the design speed of highway having a curve of 200m and coefficient of friction 0.10 is

a) 40kmph

b) 50kmph

c) 55kmph

d) 60kmph

View Answer

Answer: b
Explanation: The design velocity is given by V=√127Rf
V=√127×200×0.1
V=50Kmph

6. The design speed on a highway is 60kmph; calculate the super elevation if radius of curve is 150m and coefficient of friction is 0.15

a) 0.07

b) 0.038

c) 0.04

d) 0.15

View Answer

Answer: b
Explanation: e+f=v2/127R
e+f=3600/ (127*150)
e+f=0.188
e=0.188-0.15
e=0.038

7. The super elevation is calculated for

a) 75% of design speed including friction

b) 80% of design speed neglecting friction

c) 75% of design speed neglecting friction

d) 80% of design speed including friction

View Answer

Answer: c
Explanation: The super elevation is calculated for 75% of design speed neglecting the friction on the pavement.

8. If the super elevation is 0.07 and width of pavement is 7m then the raise of outer edge with respect to inner edge is

a) 0.47m

b) 0.48m

c) 0.49m

d) 0.50m

View Answer

Answer: c
Explanation: The raise of outer edge is given by
E=Be,
E=7*0.07=0.49m

9. The ruling minimum radius in the curve is given by

a) R=V2/127(e+f)

b) R=V’2/127 (e+f)

c) R=127 (e+f)

d) R=127/ (e+f)

View Answer

Answer: b
Explanation: The ruling minimum radius is calculated by using the minimum design speed provided by IRC.

10. The extra widening is the sum of

a) Mechanical widening and psychological widening

b) Two times of mechanical widening

c) Two times of psychological widening

d) Mechanical widening – physical widening

View Answer

Answer: a
Explanation: The extra widening is the sum of mechanical widening and physiological widening, the mechanical widening is done for safety of vehicles and psychological widening is done for the comfort of passengers.
Design of Horizontal Alignment – 2

1. The mechanical widening of a track is given by

a) $l^2/2R$

b) $nl^2/2R$

c) $nl^3/2R$

d) nl/2R

View Answer

Answer: b
Explanation: The mechanical widening of track is given by $nl^2/2R$ where n is the number of tracks, l is the length of wheel base and R is the radius of track.

2. The length of wheel base usually considered in India is

a) 6.1m

b) 5.9m

c) 5.8m

d) 5.5m

View Answer

Answer: a
Explanation: The length of the wheel base may be assumed as 6.0m or 6.1m for vehicles if data is unknown, this value is considered for commercial vehicles.

3. The total off tracking of a vehicle having wheel base length as 6.1m and radius of curve 120m is

a) 0.150

b) 0.151

c) 0.153

d) 0.155

View Answer

Answer: d
Explanation: The total off tracking of a vehicle= l2/2R
=6.1*6.1/ (2*120)
=0.155.

4. The extra width required on two lane pavement for a radius of curve 100m as recommended by IRC is

a) 0.6m

b) 0.7m

c) 0.8m

d) 0.9m

View Answer

Answer: d
Explanation: IRC recommends a value of 0.9m for two lane pavement for radius of curve 100m, this value decreases with increase in the length of curve.

5. The mechanical widening of a curve is 1.5m, the curve is having a radius of 120m and design speed as

80kmph find the total widening on the curve

a) 2.20m

b) 2.26m

c) 2.25m

d) 2.24m

View Answer

Answer: b
Explanation: The total widening is the sum of mechanical widening and psychological widening,
Extra width required=1.5m+ V/9.5√R
=1.5 + 80/9.5 √120
=2.26m.

6. The most preferred type of transition curve by IRC for highway is

a) Spiral

b) Cubic parabola

c) Parabola

d) Lemniscate

View Answer

Answer: c
Explanation: The most preferred type of transition curve by IRC for highway is parabola, for its ease of construction and other field work.

7. The minimum value of change of centrifugal acceleration is

a) 0.4m/sec^3

b) 0.5m/sec^3

c) 0.6m/sec^3

d) 0.7m/sec^3

View Answer

Answer: b
Explanation: The minimum value of change of centrifugal acceleration is 0.5 m/sec^3 and the maximum value is 0.8m/sec^3.

8. The rate of change of acceleration in m/sec^3 for a design speed of 85kmph is

a) 0.5

b) 0.6

c) 0.7

d) 0.8

View Answer

Answer: a
Explanation: The rate of change of acceleration for a design speed of 85kmph is given by
C=80/ (75+V)

C=80/ (75+85)
C=0.5m/sec^3.

9. In a steep terrain the radius of curve is 100m and the design speed is 80kmph then the length of transition curve will be

a) 44m

b) 54m

c) 64m

d) 74m

View Answer

Answer: c
Explanation: The length of the transition curve will be V2/R
Ls=80*80/100
Ls=64m.

10. The total shift of a transition curve is

a) $L^2/12R$

b) $L^2/24R$

c) $L^2/48R$

d) $L^2/96R$

View Answer

Answer: b
Explanation: The total shift of a transition curve is $L^2/24R$, where L is the length of the transition curve and R is the radius of the curve.

Design of Vertical Alignment

1. The vertical alignment of a highway includes

a) Sight distance and traffic intersection

b) Widening of pavements

c) Design of valley curves and gradients

d) Highway lighting

View Answer

Answer: c
Explanation: The design of valley curves, summit curves and gradient is included in the vertical alignment of highway.

2. The ruling gradient required for plain or rolling terrain is

a) 1 in 15

b) 1 in 20

c) 1 in 30

d) 1 in 40

View Answer

Answer: c
Explanation: The ruling gradient value required for plain and rolling terrain type of road is 1 in 30 or 3.3%.

3. The maximum grade compensation for a curve of radius 75m is

a) 1%

b) 1.4%

c) 1.5%

d) 1.6%

View Answer

Answer: a
Explanation: The maximum grade compensation is 75/R =75/75=1%.

4. The vertical alignment does not influences

a) Sight distance

b) Vehicle operation cost

c) Accidents

d) Vehicle speed

View Answer

Answer: c
Explanation: The vertical alignment influences sight distance, vehicle operation cost, vehicle speed and comfort while travelling at high speed.

5. The angle which is measured at the change of direction of two gradients is called

a) Standard angle

b) Subtended angle

c) Deviation angle

d) Setback angle

View Answer

Answer: c
Explanation: The angle which denotes the direction of change of two gradients angle is called as deviation angle.

6. The length of summit curve is based on

a) Comfort

b) Sight distance

c) Convexity

d) Deviation angle

View Answer

Answer: b
Explanation: The length of summit curve is based on stopping sight distance, it is further divided into two cases, when L>SSD and L<SSD.

7. The value of “a” in the equation y=ax2 used in the summit curve is

a) N/2L

b) N/3L

c) N/4L

d) N/5L

View Answer

Answer: a
Explanation: The value of the constant “a” is N/2L where, N is the deviation angle and L is the length of the curve.

8. If the length of the summit curve having SSD as 150m and deviation angle is 1 in 30 is

a) 50m

b) 100m

c) 150m

d) 170m

View Answer

Answer: a
Explanation: The length of the summit curve is given by
$L=NS^2/4.4$
$L=1*150*150/ (4.4*30)$
$L=170m$

9. If the deviation angle of the curve is 1/200 and the design speed is 80kmph then calculate the total length of the valley curve for comfort condition

a) 18.22

b) 18.52

c) 19.22m

d) 19.52m

View Answer

Answer: c
Explanation: The total length of the curve for comfort condition is 0.38(NV3)1/2
$=0.38(1/200*80^3)^{0.5}$
$=19.22m$

10. The equation for L<OSD for summit curve is given by

a) NS/8H

b) $NS^2/8H$

c) $NS^2/10H$

d) $NS^2/12H$

View Answer

Answer: b
Explanation: The equation of summit curve for L< OSD or L<ISD is given by $NS^2/8H$ and the height of the eye of driver is generally assumed as 1.2m.

11. The minimum length of vertical curve recommended by IRC for a design speed of 100kmph is

a) 30m

b) 40m

c) 50m

d) 60m

View Answer

Answer: d
Explanation: IRC recommends a value of 60m for curve having a design speed of 100kmph this value decreases with decrease in speed.

Traffic Engineering

1. The branch of engineering that deals with improvement of traffic performance, traffic studies and traffic network is called
a) Highway engineering
b) Railway engineering
c) Traffic engineering
d) Traffic management
View Answer

Answer: c
Explanation: The branch of engineering that deals with improvement of traffic performance, traffic studies and traffic network is called as traffic engineering, it also includes geometric design and other specifications.

2. In India for design of roads pedestrian is considered as

a) Element of traffic

b) Intruder in traffic

c) Essential part of traffic

d) Controller of traffic

View Answer

Answer: b
Explanation: In India unfortunately pedestrian is considered as an intruder in traffic and not given much importance as a result most of the victims are pedestrians only.

3. The basic objective of traffic engineering is to achieve

a) Efficient, free and rapid flow of traffic with least priority given to accidents

b) Efficient, free and rapid flow of traffic with fewer accidents

c) Efficient and rapid flow of traffic

d) Rapid flow of traffic

View Answer

Answer: b
Explanation: The basic objective of traffic engineering is to achieve efficient, free and rapid flow of traffic with fewer accidents and pedestrians are also given importance.

4. The study of traffic engineering is divided into how many major categories?

a) Five

b) Six

c) Seven

d) Eight

View Answer

Answer: c
Explanation: The study of traffic engineering is divided into 7 major categories they are traffic characteristics, traffic studies and analysis, planning and analysis, geometric design, traffic operation, road safety and administration.

5. The “3-Es” of traffic engineering stand for

a) Enforcement, empowerment and eradication

b) Engineering, education and expulsion

c) Engineering, education and enforcement

d) Engineering, education and enthusiasm

View Answer

Answer: c
Explanation: The “3-Es” in traffic engineering represent Engineering, education and enforcement.

6. In traffic engineering the elements are classified into how many categories?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: In traffic engineering the elements are classified into two categories they are human and machine.

7. Which of the following roads are congested during peak hours?

a) Rural roads

b) Urban roads

c) Highways

d) Express ways

View Answer

Answer: b
Explanation: The urban roads mostly in cities and towns are congested during morning and evening times due to the school, college and office timings.

8. The traffic survey is conducted during

a) Harvest season

b) Harvest and lean season

c) Rainy season

d) Summer season

View Answer

Answer: b
Explanation: Traffic surveys are conducted during harvest and lean season because they are more accurate and easy to conduct.

9. Design of road intersections is a part of

a) Highway engineering

b) Railway engineering

c) Traffic engineering

d) Harbour engineering

View Answer

Answer: c
Explanation: Design of road intersections is a part of highway engineering in which types of intersections, the advantages and disadvantages are studied.

10. The most important objective of traffic engineering is

a) To consider pedestrians as obstruction

b) To reduce the accidents

c) To increase the traffic

d) To provide a high speed road without any other priority

View Answer

Answer: b
Explanation: The most important objective is to reduce the accidents with considerable speed and the pedestrian should be considered as an element not obstruction.

Traffic Characteristics

1. The difference in between the set of front axle and rear axle while negotiating a horizontal curve is called

a) Psychological widening

b) Off tracking

c) Skidding

d) Slipping

View Answer

Answer: b
Explanation: Whenever a four wheeled vehicle such as bus or truck negotiates the horizontal curve then there is a centrifugal force induced and a difference is formed between front and rear axle which is called as off tracking.

2. A wheel base of 6.5m negotiates a 35m curve find the off tracking

a) 0.5m

b) 0.6m

c) 0.62m

d) 0.7m

View Answer

Answer: b
Explanation: Off tracking=l2/2R
=6.5*6.5/70
=0.6m

3. In a braking test, a vehicle was moving with a speed of 45kmph and was stopped by applying brakes, the skid marks were 10.0m in length .determine the skid resistance

a) 0.78m

b) 0.69m

c) 0.71m

d) 0.72m

View Answer

Answer: a
Explanation: speed=45/3.6
=12.5m/sec

Braking distance =u2/2gf
10=12.5*12.5/ (2*9.81*f)
F=0.78m

4. The brake efficiency in braking test is assumed as

a) 95%

b) 96%

c) 99%

d) 100%

View Answer

Answer: d
Explanation: In the braking test the wheels are assumed to be fully locked and the efficiency is assumed as 100%.

5. Gross weight, axle and wheel loads of vehicle govern the

a) Width of pavement

b) Thickness of pavement

c) Structural design of pavement and cross drainage structures

d) Traffic junctions

View Answer

Answer: c
Explanation: The weight of the vehicle and wheel loads usually recommended by IRC is used for design of pavements and cross drainage structures.

6. How many types of factors affect the traffic characteristics?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: d
Explanation: The factors affecting traffic characteristics are physical, mental, environmental and psychological.

7. The hearing, visibility and reaction time are covered in which type of factors?

a) Physical

b) Mental

c) Psychological

d) Environmental

View Answer

Answer: a
Explanation: The visibility, hearing and reaction time are related to the physical conditions of the road, they are covered under physical type.

8. An intelligent driver who consumed alcohol will have a chance of

a) Increased alertness

b) Increase in reaction time

c) Increase in speed

d) Increase in judgement

View Answer

Answer: b
Explanation: A person who is extremely intelligent if he consumes alcohol, then there is a chance of losing his control over mind temporarily and will have increase in reaction time.

9. The pollutant mostly released by automobiles is

a) CO

b) CO_2

c) $O_{3<}$

d) CH_4

View Answer

Answer: a
Explanation: The pollutant mostly released by automobiles is CO, when it is mixed with haemoglobin it forms carboxyhaemoglobin which is very dangerous for health.

10. The most likely cause of accidents is

a) Impatience in driving

b) Slow speed of vehicle

c) Pedestrians crossing the road

d) Cattle crossing the road

View Answer

Answer: a
Explanation: The most likely cause in this case is impatience in driving as it may lead to anxiety and fear; this mostly affects the user psychologically.

11. The width recommended by IRC for all type of vehicles is

a) 1.5m

b) 2.0m

c) 2.5m

d) 3.0m

View Answer

Answer: c
Explanation: IRC recommends a width of 2.5m for any type of vehicle.

12. The stability of a vehicle is influenced by

a) Width of wheel base only

b) Width of wheel base and height of gravity

c) Height of gravity only

d) Length of vehicle only

View Answer

Answer: b
Explanation: The stability of a vehicle is influenced greatly by width of wheel base and height of center of gravity is useful near horizontal curves.

13. The height of the vehicle mainly influences

a) Width of pavement

b) Length of curve

c) Clearance under structures

d) Design velocity

View Answer

Answer: c
Explanation: The clearance of structures like over bridges and under bridges mainly depends on the height of the vehicle.

14. The minimum number of parameters needed to measure brake efficiency is

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The parameters required for measuring brake efficiency are initial speed; braking distance and actual duration of braking application in these three parameters any two of them are needed.

15. If the acceleration of the vehicle is 6.17m/sec2 then the average skid resistance is

a) 0.61

b) 0.62

c) 0.63

d) 0.64

View Answer

Answer: b
Explanation: The average skid resistance f=a/g
f=6.17/9.81
=0.63

Traffic Engineering Studies and Analysis – 1

1. The first stage in the traffic engineering studies is

a) Traffic volume studies

b) Spot speed studies

c) Speed and delay studies

d) Origin and destination studies

View Answer

Answer: a
Explanation: The first step in traffic engineering studies is traffic volume studies, which are carried out to understand the traffic characteristics.

2. The traffic volume is usually expressed in

a) LMV

b) PCU

c) LCV

d) HCV

View Answer

Answer: b
Explanation: In India the traffic is heterogeneous so there are many types of vehicles, so every vehicle is expressed with the same unit PCU which means passenger car unit.

3. The number of vehicles that pass through a transverse line of road at a given time in a specified direction is called

a) Traffic studies

b) Traffic flow

c) Traffic origin

d) Traffic destination

View Answer

Answer: b
Explanation: The number of vehicles that pass through a transverse line of road at a given time in a specified direction is called as traffic flow or traffic volume expressed in PCU.

4. HCV stands for

a) Heavy commercial vehicle

b) Heavy cash vehicle

c) Heavy consolidated vehicle

d) Hard commercial vehicle

View Answer

Answer: a
Explanation: HCV stands for heavy commercial vehicle which includes trucks and buses.

5. The traffic flow is

a) Static

b) Dynamic

c) Static and dynamic

d) May be static or dynamic

View Answer

Answer: b
Explanation: The traffic flow on the roads is dynamic it changes with year, month and season. It also depends on the time daily.

6. The first objective of the traffic volume studies is

a) To decide priority for improvement of roads

b) For geometric design

c) For computing roadway capacity

d) To plan traffic operation

View Answer

Answer: a
Explanation: The first objective of the traffic volume studies is to decide priority for improvement of roads like relaying of roads, widening of roads and other works.

7. Pedestrian data is used for planning

a) Highway

b) Sidewalks and cross-walks

c) Kerb

d) Camber

View Answer

Answer: b
Explanation: The pedestrian data is used for planning of sidewalks, cross walks, subways and foot-over bridges.

8. Which of the following method is more accurate for traffic analysis?

a) Manual count

b) Automatic count

c) Average of manual and automatic

d) Past records

View Answer

Answer: b
Explanation: The automatic count is more accurate as it is done for 24 hours by machine; it is more reliable than manual counting.

9. The outgoing and incoming traffic are counted at

a) Traffic intersections

b) Highway

c) Urban roads

d) Traffic symbols

View Answer

Answer: a
Explanation: The outgoing and incoming traffic are usually counted at traffic intersections as they are convenient to count.

10. The traffic that is prepared based on 365 days of the year is called

a) Yearly traffic

b) Annual average daily traffic

c) Average daily traffic

d) Average yearly traffic

View Answer

Answer: b
Explanation: The traffic that is prepared based on 365 days of the year is called as AADT or annual average daily traffic.

11. The charts showing the variation of the traffic is called

a) Traffic chart

b) Trend chart

c) Variation chart

d) Traffic flow maps

View Answer

Answer: c
Explanation: The charts showing the variation of the traffic are called as variation charts which show the variation in day, time, year and season.

12. The traffic design in India is based on

a) 10th hourly volume

b) 20th hourly volume

c) 30th hourly volume

d) 45th hourly volume

View Answer

Answer: c
Explanation: In India the traffic design is based on 30th hourly volume which is considered as peak factor for traffic design.

13. The 5 minute count at a traffic junction is 15 find the hourly count

a) 50

b) 100

c) 120

d) 180

View Answer

Answer: d
Explanation: The hourly count =15*12
=180

14. If the traffic volume count on a road is 150 and daily factor is 1.1 and seasonal factor is 1.2 then ADT is

a) 196

b) 197

c) 198

d) 199

View Answer

Answer: c
Explanation: ADT= Traffic volume*D.F*S.F
=150*1.1*1.2
=198

15. The ratio of seven day average for 24 hour and 24 hour count on any particular day is

a) Daily factor

b) Seasonal factor

c) Annual factor

d) Weekly factor

View Answer

Answer: a
Explanation: The ratio of seven day average for 24 hour and 24 hour count on any particular day is called as daily factor.

Traffic Engineering Studies and Analysis – 2

1. The annual average daily traffic is calculated by the formula

a) ADT*DF*WF

b) ADT*DF*WF*SF

c) ADT*WF

d) ADT*SF

View Answer

Answer: b
Explanation: The AADT is given by AAADT=ADT*DF*WF*SF, it depends on traffic, day, season and week.

2. Running speed of a vehicle is equal to

a) Travel speed+ delay

b) Travel speed

c) Travel speed-delay

d) Average of travel speed and delay

View Answer

Answer: c
Explanation: The running speed of a vehicle is obtained by dividing the distance with time of travel and subtracting the delays.

3. The speed at any instant of time is called

a) Running speed

b) Travel speed

c) Spot speed

d) Space speed

View Answer

Answer: c
Explanation: The speed at any instant of time is called as spot speed or instantaneous speed, running speed is during travel and average speed of travel is travel speed.

4. Which of the following relationship is correct?

a) Travel speed= running speed

b) Travel speed< running speed c) Travel speed>running speed

d) Travel speed=1.5 times of running speed

View Answer

Answer: b
Explanation: Running speed is always greater than travel speed as the travel speed always includes the stopped delays.

5. Peak hour factor is expressed in percentage of

a) ADT

b) AADT

c) PCU

d) DF

View Answer

Answer: b
Explanation: Peak hour factor is expressed in percentage of AADT; it is used in the design of transportation facilities and major projects.

6. How many types of traffic speed studies are conducted?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: There are two types of studies conducted for speed, they are (i) spot studies (ii) speed and delay studies.

7. If the distance of a vehicle moved is 25m and the observed travel time is 15 sec then the space mean speed is

a) 4m/s

b) 5m/s

c) 6m/s

d) 7m/s

View Answer

Answer: c
Explanation: Space mean speed=3.6*25/15
=6m/sec
advertisement

8. If the space mean speed of a vehicle is 50kmph, then the time mean speed will be

a) Less than 50kmph

b) Greater than 50kmph

c) Equal to 50kmph

d) Depends on the vehicle

View Answer

Answer: b
Explanation: The Time mean speed will always be greater than space mean speed and it will be greater than 50kmph.

9. If the instantaneous speed of 4 vehicles are 35, 40, 45 and 50 then the time mean speed will be

a) 40kmph

b) 41 kmph

c) 41.5kmph

d) 42.5kmph

View Answer

Answer: d
Explanation: The space mean speed is given by
$Vt=V_1+V_2+V_3+V_4/(4)$

=35+40+45+50/ (4)
=42.5kmph

10. The geometric design in India are designed for

a) 85th percentile speed

b) 15th percentile speed

c) 98th percentile speed

d) 100 percentile speed

View Answer

Answer: c
Explanation: In India mostly the road geometrics are designed for 98th percentile speed, the upper limit for speed is 85th percentile and lower limit is 15th percentile.

Traffic Flow and Roadway Capacity

1. The weaving manoeuvres is a type of

a) Merging

b) Diverging

c) Intersection

d) Crossing

View Answer

Answer: d
Explanation: The weaving manoeuvre is a type of crossing manoeuvre as it involves crossing of traffic.

2. Which of the following does not affect traffic flow?

a) Vehicles travelling at speed

b) Length of the vehicle

c) Weather conditions

d) Geometric design

View Answer

Answer: b
Explanation: Traffic flow does not depend on the length of the vehicle, as it is not related to the flow.

3. The speed at which the value of time headway is lowest represents the

a) Optimum speed

b) Maximum speed

c) Maximum headway

d) Minimum headway

View Answer

Answer: a
Explanation: The speed at which the value of time headway is lowest represents the optimum speed.

4. In countries like USA and UAE, which of the regulation is followed?

a) Keep to left

b) Keep to right

c) Keep to middle

d) Follow intersection

View Answer

Answer: b
Explanation: In countries like US and UAE, keep to right regulation is followed as they follow the left hand drive.

5. When the gap of the vehicle changes to a smaller lane then it is called

a) Lane change

b) Forced lane change

c) Simultaneous lane change

d) Voluntary lane change

View Answer

Answer: b
Explanation: The gap of the vehicle changes to a smaller lane then it is called as forced lane change, as it forces a driver to shift to the smaller lane.

6. The vehicles per unit length at any instant of time is called as

a) Density

b) Jam density

c) Maximum density

d) Traffic flow

View Answer

Answer: a
Explanation: At any instant of time, the vehicles per unit length are called as density, if traffic speed is zero then it is called jam density.

7. The distance between the two consecutive vehicles is called

a) Space headway

b) Time headway

c) Jam density

d) Traffic flow

View Answer

Answer: a
Explanation: The distance between the two consecutive vehicles is called as space headway, and it is measured from head to head of vehicle.

8. The maximum jam density occurs at

a) Zero speed

b) 15^{th} percentile speed

c) 30^{th} percentile speed

d) 98^{th} percentile speed

View Answer

Answer: a
Explanation: The maximum jam density occurs at zero speed, which indicates that there is no movement of vehicles and the density is maximum.

9. If the space headway is 7m, then the jam density in vehicle/km is

a) 142

b) 144

c) 145

d) 146

View Answer

Answer: a
Explanation: Ki=1000/7
Ki=142 vehicles/km

10. The minimum space headway increases with

a) Increase in length of vehicle

b) Increase in width of vehicle

c) Increase in weight of vehicle

d) Increase in width of pavement

View Answer

Answer: a
Explanation: The minimum space headway increases with the length of the vehicle, if the length is more then the headway will be more.

11. Which of the following equation is correct?

a) Q=KV

b) K=qv

c) $K=qv^2$

d) V=kq

View Answer

Answer: a
Explanation: K is the density of vehicles/km and V is the velocity in kmph Q is the number of vehicles.

12. The maximum jam density occurs at

a) Ki

b) Ki/2

c) Ki/3

d) Ki/4

View Answer

Answer: b
Explanation: The maximum jam density occurs at Ki=Ki/2 and Vs. =Vsf/2.

13. If the jam density is 145vehicles/km, and velocity is 60kph then the capacity flow is

a) 2175

b) 2200

c) 2375

d) 2500

View Answer

Answer: a
Explanation: Capacity flow=145*60/4
=2175 vehicles per lane

14. The equivalency factor for car recommended by IRC is

a) 0.5

b) 1.0

c) 1.5

d) 2.0

View Answer

Answer: b
Explanation: The equivalency factor for a car is 1.0, and it increases with the difficulty for the driving of vehicle for hand cart it is 2.0.

15. The maximum theoretical capacity is

a) 1000V/S

b) 1000S/V

c) 1000S

d) 1000V

View Answer

Answer: a
Explanation: The maximum theoretical capacity is 1000V/S, where V is the velocity in kmph and S is the SSD.
Traffic Regulation and Control – 1

1. The first phase of traffic regulation is

a) Driver controls

b) Vehicle controls

c) Traffic flow regulations

d) General controls

View Answer

Answer: a
Explanation: The first phase of traffic regulation is driver controls followed by vehicle control, traffic flow regulation and general control.

2. The various regulations imposed through the traffic control devices do not include

a) Clear visibility

b) Easy recognition

c) Sufficient time for driver

d) Traffic population

View Answer

Answer: d
Explanation: The various regulations imposed through the traffic control devices do not include as they are not related to control of traffic.

3. The minimum age for attaining license for a geared vehicle is

a) 16 years

b) 18 years

c) 20 years

d) 21 years

View Answer

Answer: b
Explanation: Then minimum age for driving a non-geared vehicle is 16 years, for geared vehicle it is 18 years and for transport vehicle it is 21 years.

4. The motor vehicle act was revised in

a) 1939

b) 1988

c) 1989

d) 1987

View Answer

Answer: b
Explanation: The motor vehicle act was passed in 1939, and it was revised in 1988.

5. Traffic symbols are classified into how many categories?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The traffic symbols are classified into three types they are informatory, cautionary and mandatory.

6. The symbol when violated which may lead to offense is

a) Cautionary

b) Mandatory

c) Informatary

d) Both informatory and cautionary

View Answer

Answer: b
Explanation: Mandatory symbol is a symbol which has to be followed at all times, if violated except for special cases, they may attract penalty.

7. Which of the following is disadvantage in one way traffic?

a) Increase in average travel speed

b) More effective coordination of signal system

c) More stream lined movement of vehicles

d) More chances of overtaking

View Answer

Answer: d
Explanation: In one way traffic there are more chances of overtaking as there is traffic only in one direction, there is a chance of overtaking.

8. The total conflict points at a junction on both two way roads is

a) One

b) Four

c) five

d) six

View Answer

Answer: d
Explanation: The total number of conflict points is the sum of major and minor conflict points, major conflict points are 4 and minor conflict points are 2, so total conflict points are six.

9. The maximum number of conflict points is formed in

a) One way regulation on one road

b) One way regulation on two roads

c) Two way regulation on one road

d) Two way regulation on both roads

View Answer

Answer: d
Explanation: The maximum number of conflict points is formed in two ways regulation on both roads is 24.

10. The specifications for road signs are specified by

a) IRC 6

b) IRC 21

c) IRC 67

d) IRC 97

View Answer

Answer: c
Explanation: The specifications for road signs are specified by IRC 67-2010.

11. The diameter of the small size information board is

a) 600mm

b) 900mm

c) 1200mm

d) 1500mm

View Answer

Answer: a
Explanation: The diameter of the small size information board is 600mm, for medium size is 900mm and the large size diameter is 1200mm.

12. Which type of board should be installed if the speed limit is 100kmph?

a) Small

b) Medium

c) Large

d) Not required

View Answer

Answer: c
Explanation: Large sizes of boards are required when speed limit exceeds 100kmph, for lesser speeds small and medium sized boards can be used.
advertisement

13. Give way sign is of

a) Triangular shape

b) Circular shape

c) Octagonal shape

d) Hexagonal shape

View Answer

Answer: a
Explanation: Give way sign is of triangular shape and it is coloured with red border and white background.

14. STOP sign is having

a) Octagonal shape

b) Circular shape

c) Triangular shape

d) Any shape

View Answer

Answer: a
Explanation: STOP symbol is of octagonal shape and covered in red background and red border.

15. The clearance time is indicated by

a) Red

b) Amber

c) Green

d) White

View Answer

Answer: b
Explanation: The clearance time is indicated by amber, in some places yellow and blue color also used.
Traffic Regulation and Control – 2

1. To reduce the conflict points which method is preferable?

a) Restricting the entry in one side

b) Widening of the roads

c) Use of traffic signals

d) Diverting the traffic

View Answer

Answer: c
Explanation: In this case, use of traffic signals is advisable as it will be useful to control the traffic up to a certain extent; if it becomes heavy, then diverting may be other option which is not convenient.

2. One of the disadvantages of traffic signals is

a) Provide orderly moment at intersection

b) The quality of the traffic flow improves

c) Traffic handling capacity increases

d) The rear end collision increases

View Answer

Answer: d
Explanation: The rear end collisions are common in very highly populated cities, if there is a sudden stoppage of vehicles there is a chance of rear end collision.

3. The traffic signals that are installed for pedestrians are called

a) Traffic control signals

b) Pedestrian signals

c) Special traffic signals

d) Automatic signals

View Answer

Answer: b
Explanation: The signals that are installed for pedestrians are called as pedestrian signals; they are useful when there is no person to control the traffic.

4. The clearance time for amber is usually

a) 0.5sec

b) 1sec

c) 1.5sec

d) 3sec

View Answer

Answer: d
Explanation: The clearance time for amber may be assumed as 2sec to 4 sec, in most of the cities it is assumed as 3 seconds.

5. In trial cycle method, the average time headway is assumed as

a) 2sec

b) 2.5sec

c) 3sec

d) 3.5sec

View Answer

Answer: b
Explanation: The average headway in the trial cycle method is assumed as 2.5sec for 15mintutes of trial cycle.

6. The number of cycles for a trial period of 45 sec is

a) 20

b) 22

c) 25

d) 30

View Answer

Answer: a
Explanation: Number of cycles=900/45
=20

7. If the number of cycles in trial cycle method is 20, for traffic of 170 on one road and 160 on other road, then calculate the total green time in sec

a) 38

b) 39

c) 40

d) 41

View Answer

Answer: d
Explanation: Green time on 1st road=170*2.5/20
=21.25
Green time on 2nd road=160*2.5/20
=20
Total green time=41 sec

8. In approximate method of signals, the average time taken to cross by the pedestrian is

a) 4sec

b) 5sec

c) 6sec

d) 7sec

View Answer

Answer: d
Explanation: In approximate method, the time taken is assumed as the crossing time and initial time taken to cross, which should not be less than 7sec.

9. There is a traffic flow of 250 vehicles on road A and 200 vehicles on road B, if the green signal time on road A is 15 sec, then the green signal time of road B is

a) 10sec

b) 11sec

c) 12sec

d) 13sec

View Answer

Answer: b
Explanation: From the relationship,
Ga/Gb=na/nb
Ga/Gb=250/200
Gb=12sec

10. If the amber time at a signal is 3 sec and the green signal time is 25sec, find the red signal time

a) 22sec

b) 21sec

c) 28sec

d) 29sec

View Answer

Answer: c
Explanation: The total red time is the sum of green time and amber time, so total red time=25+3=28sec.

11. Which of the traffic signal method is based on saturation flow?

a) Trial cycle method

b) Webster method

c) IRC method

d) Approximate method

View Answer

Answer: b
Explanation: The saturation flow is the maximum flow which occurs on the peak hours and it is the maximum flow, in absence of data it is assumed as 1600PCU.

12. On a 2 phase road, the saturation flow on road A is 1000 and normal flow is 250,whereas on road B the saturation flow is 1500 and normal flow is 500,the total red time is 10 sec , find optimum cycle length

a) 35sec

b) 36sec

c) 37sec

d) 38sec

View Answer

Answer: c
Explanation: Ya=250/1000=0.4
Yb=500/1500=0.3
Y=Ya+Yb=0.7
C0=1.5*L+5/ (1-Y)
C0=1.5*14+5/ (1-0.7)
C0=87sec

13. Which type of traffic island can be used for reduction of conflict point?

a) Divisional Island

b) Channelized Island

c) Pedestrian Loading Island

d) Rotary Island

View Answer

Answer: d
Explanation: The major conflicting points can be mostly reduced by rotary islands, which are mostly used near major traffic intersections.

14. The indicators that may be marked for visible outline of the road is called

a) Roadway indicator

b) Roadway delineator

c) Roadway line

d) Roadway markings

View Answer

Answer: b
Explanation: The indicators that are marked for the visible outline are called as roadway indicators, they are of 3 types they are roadway indicator, hazard makers and object markers.

15. The guide posts are usually of height

a) 0.6m

b) 0.7m

c) 0.8m

d) 2.0m

View Answer

Answer: c
Explanation: The guide posts are usually of height 0.8-1.2m and they are placed at 45 degree angle for clear visibility.

Design of Traffic Intersections

1. Which of the following is not an intersection at grade?

a) Un-channelized

b) Channelized

c) Rotary

d) Different level intersections

View Answer

Answer: d
Explanation: The intersection at grade include un channelized, channelized and rotary intersections, the different level intersections are used for over pass and under pass.

2. An intersection that is provided for different levels of road is called

a) Intersection at grade

b) Grade separated intersections

c) Channelized intersection

d) Rotary intersection

View Answer

Answer: b
Explanation: An intersection that is provided for different levels of road is called grade separated intersection, thus eliminating the crossing manoeuvre.

3. If the velocity of a vehicle is 60kmph and the other vehicle velocity is 20kmph, then the relative velocity is

a) 80kmph

b) 40kmph

c) 20kmph

d) 60kmph

View Answer

Answer: b
Explanation: The relative velocity is the difference of the velocities moving in same direction and sum of the velocities of vehicle moving in opposite direction.

4. If the angle of merging is low, then the relative speed will be

a) Low

b) High

c) Medium

d) Depends on width of pavement

View Answer

Answer: a
Explanation: If the angle of merging is small, then the relative velocity will be low and impact will be low.

5. If an additional pavement is provided for lane change, then that intersection is called

a) Tee intersection

b) Rotary intersection

c) Flared intersection

d) Skewed intersection

View Answer

Answer: c
Explanation: If an additional pavement is provided for lane change, then that intersection is called as flared intersection, it is provided in very crowded areas.

6. Which of the following is not a requirement for intersection at grade?

a) Area of conflict should be large

b) Adequate visibility

c) Avoiding sudden change of path

d) Sufficient radius should be provided

View Answer

Answer: a
Explanation: The intersection at grade requirements do not include large conflict area, it says the area of conflict should be as less as possible.

7. The most complex type of intersections for traffic operation is

a) Un-channelized

b) Channelized

c) Rotary

d) Grade separated

View Answer

Answer: a
Explanation: The channelized intersections are the most complex type of intersections for traffic operation, but they are very easy to construct.

8. The procedure of adopting medians and traffic island in an un-channelized intersection is called

a) Dividing

b) Crossing

c) Channelizing

d) Designing

View Answer

Answer: c
Explanation: The procedure of adopting medians and traffic island in an un-channelized intersection is called as channelizing of the intersection.

9. In India the design velocity at rotary is considered as

a) 30kmph

b) 40kmph

c) 50kmph

d) 60kmph

View Answer

Answer: b
Explanation: In India, usually there is no limit to approach the rotary but for safety it is considered as 40kmph for design purposes.

10. If the coefficient of friction is 0.43, and the design velocity is 40kmph then the radius of curve is

a) 20m

b) 25m

c) 28m

d) 30m

View Answer

Answer: d
Explanation: The radius of curve is given by
$R=V^2/127f$
R=40*40/ (127*0.43)
R=30m

11. The minimum radius for rotary recommended by IRC is

a) 1.3 times of entry radius

b) 1.33 times of entry radius

c) 1.5 times of entry radius

d) 1.7 times of entry radius

View Answer

Answer: b
Explanation: IRC recommends an average radius of 1.33 times the entry radius for rotary design.

12. If the average width of the entry section is 3m and the exit is 6m then the average width is

a) 4m

b) 4.5m

c) 5.0m

d) 5.5m

View Answer

Answer: b
Explanation: The average width is average of entry and exit width
=3+6/2
=4.5m

13. The PCU value near rotary is highest for

a) Cars

b) Bus

c) Cycle

d) Animal drawn vehicles

View Answer

Answer: d
Explanation: The highest value for PCU near rotary is for animal drawn vehicle which is 4 to 6 PCU units.

14. In a traffic lane the traffic moving extreme left is 250 PCU and in extreme right it is 240 PCU, the sum of the weaving traffic crossing left and right is 500 PCU, find proportion of weaving traffic

a) 0.5

b) 1.5

c) 2.5

d) 3.0

View Answer

Answer: a
Explanation: b is the proportion of traffic entering into rotary, c is the proportion of traffic leaving the rotary, a is the proportion of traffic moving in the left lane and d is the proportion of traffic moving in the right line
P=b + c/ (a + b + c+ d)
P=500/ (250+500+240)
P=0.5

15. The capacity of rotary in PCU per hour for a proportion of weaving traffic 0.5 and the width of weaving section is 12m, average width of entry is 0.4m and length of the weaving section is 7.2m

a) 1088 PCU

b) 1100PCU

c) 1200 PCU

d) 1300PCU

View Answer

Answer: a
Explanation: Qi= 280W [1+e/W][1-p/3] / (1+W/L)
Q=280*12*[1+0.4/12][1-0.5/3] /(1+12/7.2)
Q=1088PCU
Design of Parking Facility

1. The best type of interchange can be provided with

a) Rotary

b) Diamond

c) Partial cloverleaf

d) Full cloverleaf

View Answer

Answer: d
Explanation: Full clover leaf interchange provides all the required facilities for interchange and it is the most convenient to use.

2. A grade intersection may be provided if the PCU exceeds

a) 5000

b) 6000

c) 7000

d) 10000

View Answer

Answer: d
Explanation: If the PCU value exceeds 10000 then the grade separators may be used as and when required.

3. The capacity of an uncontrolled intersection is

a) 1000 to 1200 vehicles /hour

b) 1100 to 1200vehilces/hour

c) 1200 to 1400 vehicles/hour

d) 1400 to 1600 vehicles/hour

View Answer

Answer: c
Explanation: The capacity of an uncontrolled intersection is 1200-1400 vehicles/hour, if there is no traffic signal or police to control it.

4. The ramps in the grade separated intersections do not include

a) Direct

b) Semi direct

c) Indirect

d) Cloverleaf

View Answer

Answer: d
Explanation: Clover leaf is a type of inter change, it is not an intersection, whereas all the remaining are a type of intersection.

5. The product of fast moving vehicles and number of trains should exceed by how much to justify the bypass road construction?

a) 25000

b) 5000

c) 50000

d) 250000

View Answer

Answer: a
Explanation: If the product of fast moving vehicles and number of trains should exceed by 25000 then we have to justify the bypass road construction and if it exceeds 50000 it is mandatory.

6. Parking facilities may be classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The parking facilities are classified into two types, they are on street and off street parking.

7. The type of parking in which the vehicles are parked along the kerb is called

a) Kerb parking

b) Off-street parking

c) Parallel parking

d) Angle parking

View Answer

Answer: a
Explanation: The type of parking in which the vehicles are parked along the kerb is called kerb parking.

8. Which type of parking facility is convenient for all types of users?

a) Kerb parking

b) Off-street parking

c) Parallel parking

d) 90 degree parking

View Answer

Answer: d
Explanation: The 90 degree parking is most convenient for users as it is easy to park and easy to handle even for new users.

9. The maximum number of cars can be parked in

a) Kerb parking

b) Off-street parking

c) Parallel parking

d) 90 degree parking

View Answer

Answer: c
Explanation: The maximum number of vehicles can be accommodated for same length in parallel parking.

10. The number of parking spaces for a kerb of 59m and having the length of car as 5.0m is

a) 9

b) 10

c) 11

d) 12

View Answer

Answer: b
Explanation: Number of parking spaces =59/5.9
=10
Here, extra width of 0.9m is considered, because the vehicles cannot be parked very close.

11. The first stage of parking lot is

a) Entrance

b) Acceptance

c) Storage

d) Delivery

View Answer

Answer: a
Explanation: The first stage of parking lot is entrance followed by acceptance, storage, delivery and exit.

12. The parking facility in which elevators are required to change to a different level is called

a) Parking lot

b) Multi storeyed building

c) Clover leaf junction

d) Ramp

View Answer

Answer: b
Explanation: In multi storeyed buildings, usually in tall buildings there is elevator provided to change the level of parking.

13. In 90 degree parking the length of kerb is 25m, the parking spaces are

a) 10

b) 11

c) 12

d) 13

View Answer

Answer: a
Explanation: Parking spaces in 90 degree parking=25/2.5
=10

14. The place allotted particularly for only parking is called

a) Parking lot

b) Parking space

c) Clover space

d) Traffic parking

View Answer

Answer: a
Explanation: The place allotted particularly for only parking is called as parking lot.

15. The most inconvenient method for parking is

a) 30 degree parking

b) 45 degree parking

c) 90 degree parking

d) Parallel parking

View Answer

Answer: a
Explanation: 30 degree parking is the most inconvenient as everyone cannot turn in this angle.90 degree parking is convenient and in parallel most cars can be handled.
Pedestrian Facilties

1. The road traffic consists of how many types of traffic?

a) Vehicle traffic

b) Pedestrian traffic

c) Vehicular and pedestrian traffic

d) No traffic

View Answer

Answer: c
Explanation: The road traffic consists of both vehicular traffic and pedestrian traffic.

2. Which of the following is not a consequence of pedestrian using roadway?

a) Reduction in effective roadway

b) Reduction in running speed

c) Reduction in capacity of road

d) Increase of zebra crossings

View Answer

Answer: d
Explanation: Zebra crossings are meant only for crossing of pedestrians, it is not related to roadway.

3. In which type of transport, walk mode is mandatory?

a) Personal vehicles

b) Public transport

c) Ships

d) Airways

View Answer

Answer: b
Explanation: Mostly in public transport like bus and metros, walking is mandatory for a long distance.

4. The most vulnerable part of traffic is

a) Traffic jam

b) Vehicles

c) Pedestrians

d) Cattle

View Answer

Answer: c
Explanation: Pedestrians are the most vulnerable part of traffic and they should be treated with utmost care.

5. The main objective of pedestrian facility is

a) To minimize the pedestrian conflicts

b) To minimize the traffic conflicts

c) To minimize the traffic on road

d) To maximize the pedestrians on road

View Answer

Answer: a
Explanation: The main objective of pedestrian facility is to minimize the pedestrian conflicts caused by vehicles.

6. The studies that are conducted for planning the facilities of pedestrians is called

a) Pedestrian studies

b) Pedestrian volume studies

c) Geometric studies

d) Statistics

View Answer

Answer: b
Explanation: The studies that are conducted for planning the facilities of pedestrians are called pedestrian volume studies.

7. The width requirement of side walk depends on

a) Pedestrian flow

b) Traffic flow

c) Pedestrian and traffic flow

d) Climatic conditions

View Answer

Answer: a
Explanation: The width requirement of side walk depends on pedestrian flow of that area, traffic doesn't travel on footpath and climate doesn't affect the pedestrian but affects the design.

8. The pedestrian facilities are planned for

a) Present requirement

b) Estimated growth of population

c) Past population

d) Both present and past requirements

View Answer

Answer: b
Explanation: The facilities like footpath and sidewalks are planned for future estimated population.

9. The minimum width of side walk is

a) 1.0m

b) 1.5m

c) 1.75m

d) 2.0m

View Answer

Answer: b
Explanation: The minimum width of side walk is considered as 1.5m it may be more depending on the requirement.

10. The width requirement of side walk is decided with the help of

a) Pedestrians

b) Vehicles

c) Pedestrian flow

d) Vehicular flow

View Answer

Answer: c
Explanation: The width requirement of side walk is decided with the help of pedestrian flow, its width is decided based on pedestrian flow.

11. The dead width usually considered as

a) 0.5m

b) 1.0m

c) 1.5m

d) 2.0m

View Answer

Answer: b
Explanation: The dead width usually is considered as 1.0m and in shopping areas it may be more, it is a width which is not mostly used, usually left for setback.

12. If the side walk is 1.5m, then the capacity of pedestrians in one way is

a) 1200

b) 800

c) 1600

d) 2400

View Answer

Answer: a
Explanation: If the side walk is 1.5m, then the capacity of pedestrians in one way is 1200, it increases with increase in the width.

13. The cross slope of paved footpath may be

a) 1 to 2%

b) 2 to 3%

c) 3 to 4%

d) 4% only

View Answer

Answer: c
Explanation: The cross slope of footpath may be 3 to 4% and in unpaved it may be 4 to 6%.

14. Which of the following is a controlled type of pedestrian crossing?

a) Pavement marking

b) Studs

c) Warning signs

d) Pedestrian signals

View Answer

Answer: d
Explanation: Pedestrian signals are a type of traffic signals used to control the pedestrian traffic, warning signals are for traffic.

15. The approach velocity as per IRC for pedestrian crossing facilities is

a) 60kmph

b) 65kmph

c) 70kmph

d) 75kmph

View Answer

Answer: b
Explanation: The approach velocity as per IRC is considered as 65kmph, for the safety of pedestrian but it may depend varying on the conditions.

Highway lighting

1. The highway accidents occur mostly at

a) Day time

b) Night time

c) Both day and night

d) Early morning hours

View Answer

Answer: b
Explanation: The highway accidents occur mostly at night time, if adequate lighting is not provided.

2. Highway lighting is more important at

a) Cities

b) Towns

c) Villages

d) Bridges

View Answer

Answer: d
Explanation: Highway lighting is more important at bridges, because its boundaries should be visible even at night time.

3. Road lighting is a

a) Advantage for users

b) Disadvantage for users

c) Economically profitable

d) Obstruction for users

View Answer

Answer: a
Explanation: Road lighting is an added advantage for users, even headlight of vehicles may be sufficient but it would be better if it is provided.

4. During the construction of highway, more highway lighting preference is given to

a) Village

b) Town

c) City

d) Intersections

View Answer

Answer: d
Explanation: During the construction of highway, more highway lighting preference is given to intersections, as it is the most critical place.

5. If the object appears darker than the road surface it is called

a) Discernment

b) Partial discernment

c) Silhouette

d) Reverse silhouette

View Answer

Answer: c
Explanation: If the object appears darker than the road surface it is called as silhouette. If the reverse process occurs it is called reverse silhouette.

6. Which of the pavement is better for highway lighting?

a) Black top surface

b) Cement concrete

c) WBM

d) Gravel roads

View Answer

Answer: b
Explanation: Cement concrete roads have a better visibility than other all roads, but they are more expensive.

7. The objects adjacent to the pavement are seen by

a) Silhouette

b) Reverse silhouette

c) Lamps

d) Head lights

View Answer

Answer: b
Explanation: The objects adjacent to the pavement are seen by a process called as reverse silhouette.

8. The intensity of highway lighting is measured in

a) Lux

b) Candela

c) Lumen

d) Dioptres

View Answer

Answer: a
Explanation: The intensity of highway lighting is measured usually in lux, dioptre is unit of focal power, candela and lumen are also units of intensity of light, but not usually used.

9. The minimum amount of highway lighting to be provided on urban roads is

a) 10 Lux

b) 15 Lux

c) 30 lux

d) 40 Lux

View Answer

Answer: c
Explanation: IRC recommends a minimum of 30 lux on urban roads and 15 lux on rural roads.

10. Which of the design factors considered in roadway lighting provide all the necessary features?

a) Lamps

b) Luminaire distribution of light

c) Spacing of lighting

d) Lateral placements

View Answer

Answer: b
Explanation: The design factors considered in roadway lighting provide all the necessary features are luminaire distribution of light.

11. Which lamps are preferred at intersections?

a) Sodium-vapour

b) Mercury

c) Filament

d) Fluorescent

View Answer

Answer: a
Explanation: Sodium vapour lights are mostly preferred at intersections, as they provide more lighting and are economical.

12. The ratio of average illumination recommended by IRC is

a) 0.3

b) 0.4

c) 0.5

d) 0.6

View Answer

Answer: b
Explanation: The ratio of average illumination recommended by IRC is 0.4, for national highway it is better if it is more than 0.4 for illumination purpose.

13. The clearance recommended by IRC for poles in urban roads is

a) 0.3m

b) 0.4m

c) 0.5m

d) 0.6m

View Answer

Answer: d
Explanation: The clearance recommended by IRC is 0.6m from raise of kerb and in non-availability of space it may be reduced to 0.3m.

14. The spacing between the highway lamps is

a) 10 to 15m

b) 15 to 30m

c) 30 to 45m

d) 30 to 60m

View Answer

Answer: d
Explanation: The spacing between the highway lamps is between 30-60m, they are not fixed they may vary but they are recommended between 30-60m distance.

15. The maintenance factor of highway is assumed as

a) 0.5

b) 0.6

c) 0.7

d) 0.8

View Answer

Answer: d
Explanation: The average life or maintenance factor can be assumed as 80% or 0.8, this is an assumption only it may also be 100%.

Traffic Planning and Management

1. Land use, transportation and road network plans are

a) Inter linked

b) Intra linked

c) Not linked

d) Depends on the network

View Answer

Answer: a
Explanation: Land use, transportation and road network plans are inter linked to each other and they are inseparable.

2. The main cause of accidents in urban areas is

a) Improper planning

b) Extra wide roads

c) Additional thickness of pavement

d) Traffic congestion

View Answer

Answer: a
Explanation: The main cause of accidents in urban areas is improper planning, no adequate facilities and increase of traffic.

3. The first stage in the function of traffic engineering department is

a) Planning and design

b) Collection of data

c) Investigations

d) Finance

View Answer

Answer: b
Explanation: The first stage in the function of traffic engineering department is collection of data followed by analysis and design.

4. Traffic forecast is not influenced by

a) GDP

b) Industrial output

c) Population

d) Weather

View Answer

Answer: d
Explanation: Weather cannot influence the traffic forecast, as it is not related to traffic engineering, the remaining directly or indirectly are related to the traffic.

5. Demographic factors do not include

a) GDP

b) Population in urban cities

c) Population in rural areas

d) Overall population

View Answer

Answer: a
Explanation: Demographic factors include population, population in urban and rural areas, GDP accounts for economic factors.

6. The NHDP are being undertaken by private companies on basis of

a) Profit

b) Revenue

c) BOT

d) Commission basis

View Answer

Answer: c
Explanation: In India mostly private and govt. sectors follow BOT which means build operate transfer, it is built by private firm and later transferred to govt.

7. The traffic will increase if the

a) Price of fuel decreases

b) Price of vehicles decreases

c) Price of fuel decreases

d) Price of vehicles decreases

View Answer

Answer: b
Explanation: The traffic increases if the prices of vehicle decreases, price of fuel may increase and decrease, but if the price of vehicle decreases then the traffic increases.

8. The traffic population is estimated by

a) Arithmetic method

b) Geometric method

c) Incremental increase method

d) Harmonic method

View Answer

Answer: b
Explanation: The population forecast is calculated by
$P=P_0 (1+r)^n$
Where, P is the expected population, n is the number of years, P_0 is the present population.

Materials used in Highway Construction

1. The materials not included in highway construction are

a) Stone

b) Dust

c) Soil

d) Petrol

View Answer

Answer: d
Explanation: Petrol is not used directly in highway construction, but by-product like bitumen is used.stone, dust and soil may be used in subgrade and base.

2. For places where there is a passage of flood water then the highway has to be built on

a) Embankment

b) Subway

c) Overpass

d) Underpass

View Answer

Answer: a
Explanation: If the HFL is more than the formation level of the road which is going to be provided, then it has to be built on embankment.

3. The layer which is constructed above embankment is called

a) Sub grade

b) Fill

c) Base

d) Sub base

View Answer

Answer: a
Explanation: The embankment is the lowest layer and it is below the sub grade, base is above sub base, sub base is above the sub grade.

4. The highest CBR number is required for

a) Pavement

b) Sub grade

c) Sub base

d) Base

View Answer

Answer: b
Explanation: CBR number decreases with increase in height, the soil requires highest CBR and the pavement requires the lowest CBR.

5. The most common waste material used in construction is

a) Fly ash

b) Slag

c) Pozzolona

d) Rice husk

View Answer

Answer: a
Explanation: Fly ash is an industrial waste obtained from the thermal plants, it has been mandatory to use the fly ash in bricks.

6. Bitumen is a by-product of

a) Wood

b) Petroleum

c) Kerosene

d) Coal

View Answer

Answer: b
Explanation: Bitumen is obtained by burning the petroleum at high temperatures, it is mostly used in the construction of flexible pavements.

7. Tar is a by-product of

a) Wood

b) Petroleum

c) Kerosene

d) Coal

View Answer

Answer: a
Explanation: Tar is a by-product which is obtained from wood, tar and bitumen may look similar, but they are not the same.

8. In the initial stage of construction which type of pavement is cheap?

a) Flexible

b) Rigid

c) Composite

d) WBM

View Answer

Answer: a
Explanation: Flexible pavements are easy to construct and have cheaper cost than C.C pavements and also they are easily accessible to the users.

Soil – 1

1. A good soil should have

a) Ease of compaction

b) Temporary strength

c) High sensitivity

d) High void ratio

View Answer

Answer: a
Explanation: A good soil should have ease of compaction, permanent strength and less sensitivity.

2. The process by which the water voids are removed is called

a) Compaction

b) Consolidation

c) Permeability

d) Shear strength

View Answer

Answer: b
Explanation: The water voids are mostly removed by consolidation; it is a long process so mostly compaction is used.

3. If the GWT rises to the ground level, then the bearing capacity reduces by

a) 1/2

b) 1/3

c) 1/4

d) 3/4

View Answer

Answer: a
Explanation: The bearing capacity of the soil reduces by 50%, if the ground water rises to the ground level.

4. The most common method used for the removal of voids in soil is

a) Compaction

b) Consolidation

c) Permeability

d) Shear strength

View Answer

Answer: a
Explanation: Compaction is the most commonly used method for removal of voids; it is mostly done by modified proctor or standard proctor test.

5. The volume of voids in the 3 phase diagram of soil is

a) Volume of air

b) Volume of water

c) Volume of air and volume of water

d) Volume of solids

View Answer

Answer: c
Explanation: Both the volume of air and volume of water contribute to the voids in the 3 phase diagram of soil.

6. The ratio of volume of voids and volume of soil solids is called

a) Void ratio

b) Porosity

c) Saturation

d) Air content

View Answer

Answer: a
Explanation: The ratio of volume of voids and volume of soil solids is called as void ratio, porosity is the ratio of voids and total volume, saturation is volume of voids in volume of water, air content is air voids in volume.

7. Montimorrite is a type of mineral which causes expansive behaviour is found in

a) Black cotton soil

b) Laterite soil

c) River soil

d) Glacial soil

View Answer

Answer: a
Explanation: Montimorolite is a type of mineral which is of expansive nature, it isfound in mostly black cotton soil.

8. The soil that is formed by the action of wind is called

a) Lacustrine soil

b) Alluvial soil

c) Aeolian soil

d) Glacial soil

View Answer

Answer: c
Explanation: The soil that is formed by the action of wind is called as Aeolian soil, lacustrine by lakes, alluvial by River and glacial by glacier.

9. The maximum density which is desirable in highway embankments is

a) Dry density

b) Saturated density

c) M.D.D

d) O.M.C

View Answer

Answer: c
Explanation: The maximum density which is desirable in highway embankments is M.D.D, if it is greater than MDD then it's density decreases.

10. The void ratio can never be

a) Less than 1

b) Greater than 1

c) Less than zero

d) Equal to 1

View Answer

Answer: c
Explanation: The void ratio can never be less than zero, as it is a positive quantity, but it can be greater than 1 or equal to 1.

11. In Indian system the soil is classified as per

a) USCS

b) ISCS

c) BIS

d) ASTM

View Answer

Answer: b
Explanation: In Indian system the soil is classified as per ISCS. In international as per USCS, BIS regards the standard in India and ASTM in USA.

12. The theoretical void ratio of sand is taken as

a) 0.87

b) 0.91

c) 1.01

d) 1.03

View Answer

Answer: b
Explanation: The theoretical void ratio of sand is taken as 0.91.

13. If the water content of a soil sample is 25%, and dry density is 15KN/m^3 then its dry density in KN/m^3 is

a) 18.75

b) 19

c) 20

d) 21

View Answer

Answer: a
Explanation: $\gamma_d = \gamma/1+w$
$\gamma = 15*1.25$
$= 18.75 KN/m^3$

14. If the permeability is high then its void ratio is

a) High

b) Low

c) Medium

d) Depends on soil

View Answer

Answer: a
Explanation: If the void ratio is high then, the permeability of the soil will be very high, for example gravel in which there is a lot of void ratio so permeability is very high.

15. The property of soil by which its state and size changes is called

a) Activity

b) Sensitivity

c) Thixotropy

d) Shear strength

View Answer

Answer: c
Explanation: Thixotropy means changing on touch; it is used for very sensitive soils.

Soil – 2

1. The specific gravity of sand is

a) 2.5

b) 2.6

c) 2.7

d) 2.9

View Answer

Answer: c
Explanation: The specific gravity of sand is usually considered as 2.7-2.8 in non-availability of data.

2. In field, the dry density of soil can be determined by?

a) Oven method

b) Sand bath

c) Burning

d) Sand replacement

View Answer

Answer: c
Explanation: If there is no facility of lab, then the dry density can be instantly tested by burning.

3. Which type of roller is most suitable for soil compaction?

a) Smooth roller

b) Sheep foot roller

c) Pneumatic roller

d) Hydraulic roller

View Answer

Answer: b
Explanation: The sheep foot roller compact the soil both by the action of kneading and pressing, so they are the most suitable for compaction.

4. The unpaved shoulder usually consists of

a) Gravel

b) Sand

c) Bricks

d) Clay

View Answer

Answer: a
Explanation: In case of unpaved shoulders, gravel is most preferred because of its permeability, strength and other advantages.

5. The specific gravity of sand is determined by?

a) Pyconometer

b) Density bottle

c) Hydrometer

d) Oven

View Answer

Answer: b
Explanation: The specific gravity of sand is determined by density bottle method, as it is a fine grain soil and for coarse aggregate it is tested by pyconometer.

6. The liquid limit of the soil is determined by

a) Hydrometer

b) Pyconometer

c) Sand bottle

d) Cassagrandes apparatus

View Answer

Answer: d
Explanation: The liquid limit of the soil is determined by cassagrandes apparatus, which consists of recording the number of blows for specified water content.

7. The shear strength is more for

a) Cohesive soil

b) Non cohesive soil

c) Frictionless soil

d) Dust

View Answer

Answer: a
Explanation: The shear strength is more for cohesive soils, if the soils depend only on friction then it is very dangerous, so cohesive soil are strong and advisable.

8. The weight of the hammer in modified proctor test apparatus is

a) 2.8kg

b) 4.7kg

c) 5.0kg

d) 6.0kg

View Answer

Answer: b
Explanation: The weight of the hammer in modified proctor test apparatus is 4.7kg and in simple proctor it is 2.8 kg.

9. Coefficient of permeability is more for

a) Gravel

b) Sand

c) Clay

d) Brick

View Answer

Answer: a
Explanation: Coefficient of permeability is more for gravel, as the size increases the permeability increases, sand has higher permeability than clay and brick has the least permeability.

10. Which type of soil is suitable for construction of pavement?

a) Black cotton soil

b) Sand

c) Stone dust

d) Gravel

View Answer

Answer: d
Explanation: Gravel is the most suitable type of soil for pavement construction; replaced soils are mostly filled by gravel.

11. Coefficient of uniformity is

a) D_60

b) D_{10}

c) D_{60}/D_{10}

d) D_{30}

View Answer

Answer: c
Explanation: Coefficient of uniformity is D_{60}/D_{10}, where D_{60} is the percentage of passing for 60mm sieve and D_{10} is the percentage of passing for 10mm sieve.

12. The slope of curve obtained between the number of blows and water content in the cassagrande's method is

a) Toughness index

b) Activity

c) Flow index

d) Liquid limit

View Answer

Answer: c
Explanation: The slope of curve obtained between the number of blows and water content in the cassagrande's method is called as flow index.
advertisement

13. If the sensitivity of the soil is greater than 16 then it is

a) Insensitive

b) Little sensitive

c) Highly sensitive

d) Quick

View Answer

Answer: d
Explanation: If the sensitivity of the soil is greater than 16 then it is very quick soil, if it is near to zero then it is not so sensitive soil.

14. Gravel having well grading is denoted by

a) GW

b) GP

c) SM

d) SW

View Answer

Answer: a
Explanation: Gravel having well grading is denoted by GW, where G denotes the gravel and W defined well grading, P denotes poor grading and S denotes the sand.

15. The fine grain soils are classified according to

a) Atterbergs limits

b) Atterbergs charts

c) USCS

d) ISCS

View Answer

Answer: a
Explanation: The fine grain soils are classified according to Atterberg charts, which are classified as per A-line, they are represented in Atterberg charts and classified as per USCS and ISCS.
Stone Aggregates – 1

1. If the load value at 2.5mm penetration in CBR is 190kg and the load for 5.0mm penetration is 48kg, then the CBR value at 5 mm penetration is

a) 4.6

b) 4.4

c) 4.3

d) 4.1

View Answer

Answer: b
Explanation: CBR value at 5.0mm penetration=48*190/2055
=4.4%

2. The plate bearing test is used to evaluate

a) Modulus of sub grade reaction

b) Modulus of sub base reaction

c) Modulus of base reaction

d) Modulus of pavement

View Answer

Answer: a
Explanation: The plate bearing test is used to evaluate the modulus of subgrade reaction “k” which is used in westergards analysis.

3. If the shear strength of the non-cohesive soil is 84KN/m^2 and angle of friction is 30 degrees, then the normal strength in KN/m^2 is

a) 140

b) 141

c) 143

d) 145

View Answer

Answer: d
Explanation:
$S=c+\sigma\tan\theta$
$84=\sigma\tan30$
$\sigma=145$

4. Stone aggregate do not have to resist

a) Weathering effect

b) Traffic load

c) Wheel load stress

d) Soil load

View Answer

Answer: d
Explanation: Stone aggregate do not have to resist the soil load as they are transferred by foundation only, weathering traffic and wheel load are directly experienced by aggregates.

5. Sand obtained from river is used as

a) Course aggregate

b) Fine aggregate

c) Filling materials

d) Substitute

View Answer

Answer: b
Explanation: Sand obtained from river is used as fine aggregate as it can be used to fill the voids in the concrete, coarse aggregate is obtained from the rock, sand is not used as filling material but stone dust can be used if sand is not available.

6. Soft aggregates are used in

a) Lower layers

b) Upper layers

c) Everywhere in the pavement

d) Depends on the material

View Answer

Answer: a
Explanation: Soft aggregates cannot resist the weathering action and wheel load of the vehicle, so they are preferred in lower layers, as they are impacted directly.

7. Which of the following is a soft aggregate?

a) Brick

b) Gravel

c) Clay

d) Silt

View Answer

Answer: a
Explanation: Bricks are not actually aggregates, but the crushed bricks or over burnt bricks are used as aggregates in pavement they are not so hard as the hard aggregate.

8. Impact value is used to measure

a) Hardness

b) Toughness

c) Wheel load

d) Strength

View Answer

Answer: b
Explanation: The impact value of an aggregate is used to measure its toughness; if it is tough then it has a low impact value, hardness is for resistance to abrasion, strength is resistance to crushing.

9. The capability of aggregate to resist more weathering action and wheel load is called

a) Hardness

b) Toughness

c) Durability

d) Angularity

View Answer

Answer: c
Explanation: Durability is the period till which the aggregate can resist the weathering action and other loads, hardness is the resistance to abrasion and toughness is the resistance to impact.

10. If the aggregates are exceptionally strong then they are having impact value

a) Less than 10

b) Less than 15

c) Less than 30

d) Greater than 30

View Answer

Answer: a
Explanation: The aggregates which have a less impact value are exceptionally tough, but normally the aggregate upto 30% impact value can be used.

11. The skid number for highways should not be less than

a) 55

b) 45

c) 35

d) 25

View Answer

Answer: a
Explanation: The skid number for highways should not be less than 55 for national highways to ensure smooth ride, if it is less than 55 then suitable precautions have to be taken.

12. The specific gravity for aggregates should be within the range of

a) 2.5-2.8

b) 2.6-2.9

c) 2.4-2.6

d) 2.2-2.6

View Answer

Answer: b
Explanation: The specific gravity for aggregates should be within the range of 2.6-2.9 for pavement construction purposes.

13. The crushing value of the aggregate determines its

a) Hardness

b) Strength

c) Toughness

d) Durability

View Answer

Answer: b
Explanation: The resistance to crushing is referred as strength, whereas the resistance to abrasion is called hardness.

14. The flakiness index for surface dressing should not exceed

a) 15%

b) 25%

c) 35%

d) 45%

View Answer

Answer: b
Explanation: The flakiness index for aggregates that are used in the pavement surface dressing should not exceed 25%, but in any case combined flakiness and elongation index should never exceed 30%.

15. The sum of flakiness index and elongation index should not exceed

a) 15

b) 20

c) 30

d) 40

View Answer

Answer: c
Explanation: IRC recommends the combined flakiness and elongation index not to exceed 30%. for the aggregate that should be used in a highway.

Stone Aggregates – 2

1. Aggregates obtained from which type of rocks are strong?

a) Igneous

b) Sedimentary

c) Metamorphic

d) Rocks formed by weathering

View Answer

Answer: a
Explanation: Aggregates that are obtained from igneous rocks are strongest they include granite, basalt. Sedimentary are obtained from igneous rocks and metamorphic from igneous and sedimentary so they are not so strong.

2. The maximum size that can be used in plain concrete is

a) 40 mm

b) 20 mm

c) 100 mm

d) 80 mm

View Answer

Answer: d
Explanation: The maximum size of aggregate that can be used in plain concrete is 80mm with ease of workability, however they exceed in some special cases up to 100 mm, mostly 20 mm aggregate is used in RCC and 40 mm in pavements.

3. The maximum size of aggregate that can be used in R.C.C is

a) 10mm

b) 15mm

c) 20mm

d) 25mm

View Answer

Answer: c
Explanation: The maximum size of aggregates used in RCC is limited to 20mm, for ease of compaction and workability, however 10 mm, 15 mm are also used, in some exceptions 25 mm also is used.

4. The flaky aggregates should not exceed

a) ½ of mean dimension

b) $3/4^{th}$ of mean dimension

c) $3/5^{th}$ of mean dimension

d) $1/8^{th}$ of mean dimension

View Answer

Answer: c
Explanation: The flaky aggregate is usually considered as $3/5^{th}$ of its mean lateral dimension, the flaky aggregates should not be used in pavements.

5. The factors which effect the formation of metamorphic rocks are

a) Heat

b) Pressure

c) Heat and pressure

d) Molten lava

View Answer

Answer: c
Explanation: Metamorphic rocks are obtained both from sedimentary and igneous rocks, which are influenced by factors like heat and pressure.

6. The fine aggregates are having a size less than

a) 5mm

b) 4.75mm

c) 2.36 mm

d) 75 microns

View Answer

Answer: b
Explanation: If the sieve size of aggregates less than 4.75mm, then it is called as fine aggregate. If it exceeds 4.75 mm it is gravel, if it is less than 75 microns it is a fine grain soil.

7. Which type of aggregates gives good workability?

a) Round

b) Flaky

c) Angular

d) Irregular

View Answer

Answer: a
Explanation: The aggregates which gives more ease of working and workability is round aggregate, flaky and angular also used in some cases, irregular also are used in pavements.

8. If the bulk density of an aggregate is 2.6kg/lit and Gs is 2.8 then, the percentage of voids is

a) 7.1

b) 71

c) 710

d) 0.71

View Answer

Answer: a
Explanation: Percentage of voids=G-Y/G
=2.8-2.6/ (2.8)
=7.14%

9. The dividing and operating of aggregates into different sizes is called

a) Sieve analysis

b) Gap grading

c) Impact

d) Hardness

View Answer

Answer: a
Explanation: The operating and division of the aggregates as per size is called as sieve analysis, in which the particles are divided as per size, gap grading is a part of the graph drawn in sieve analysis.

10. The expansion of aggregate on reaction with water is called

a) Swelling

b) Bulking

c) Expelling

d) Breaking

View Answer

Answer: b
Explanation: If the aggregate reacts with water and its volume increase then it is called as bulking, swelling is absorption of water, expelling is removal of water, and breaking is complete failure.

11. The skid resistance is measured in

a) Swedish pendulum number

b) British pendulum number

c) Indian pendulum number

d) Friction coefficient

View Answer

Answer: b
Explanation: The skid resistance of the pavement is measured in British pendulum number, which is obtained just by rubbing the material with equipment.

12. Which material can be replaced in concrete for a strong pervious concrete pavement?

a) Water

b) Course aggregate

c) Fine aggregate

d) Cement

View Answer

Answer: b
Explanation: Apart from replacement, there are many materials that can be used for substitution, for a strong pervious concrete pavement better option is to replace coarse aggregate.

13. The minimum grade of concrete required for pavement design is

a) M30

b) M35

c) M40

d) M45

View Answer

Answer: c
Explanation: The minimum grade of concrete required for pavement is M40 as it has to resist both wheel loads and weathering action, M30 for low volume roads, M45 may be more helpful.

14. The aggregates which do not have sufficient strength like waste bricks can be used in

a) Base

b) Shoulder

c) Surface

d) Footpath

View Answer

Answer: d
Explanation: The aggregates which don't have sufficient strength can be used in footpath as it is not so important component, surface and shoulder use gravel, base mostly requires high strength soil.

Bituminous Binders

1.Bitumen is obtained from

a) Wood

b) Petroleum

c) Coal

d) Kerosene

View Answer

Answer: b
Explanation: Bitumen is a product that can be obtained from petroleum, bitumen is the most preferred material for pavement now.

2. Tar is obtained from

a) Wood

b) Petroleum

c) Coal

d) Kerosene

View Answer

Answer: a
Explanation: Tar is a byproduct of wood, both tar and bitumen look similar and used for pavement.

3.Tar is not used now because of

a) Cost

b) Efficiency

c) Harmful effects

d) Not satisfactory

View Answer

Answer: c
Explanation: Tar is not being used now because of its heating effects and poisonous gases released during heating.

4.Bitumen is

a) Pyrogenous

b) Natural

c) Either natural or pyrogenous

d) Artificial

View Answer

Answer: c
Explanation The bitumen may be natural or pyrogenous which is completely soluble in carbon disulfide and carbon tetrachloride.

5.The bitumen is completely soluble in

a) Carbon monoxide

b) Carbon dioxide

c) Carbon sulfide

d) Carbon disulfide

View Answer

Answer: c
Explanation: Bitumen is completely soluble in carbon disulfide and carbon terachloride, these are the chemical substances in which bitumen dissolves completely.

6.The resistance to flow is measured by

a) Flash and fire

b) Viscosity

c) Penetration test

d) Ductility test

View Answer

Answer: b
Explanation: The resistance to flow of the liquid is called as viscosity, the other tests are also conducted for bitumen, in viscosity the viscosity grade of bitumen is obtained.

7.The temperature used in highway pavement in degrees centigrade is

a) 130

b) 120

c) 115

d) 175

View Answer

Answer: d
Explanation: The temperature varies between 130 and 175 degrees centigrade and it may also be above it, depending on the exposure of heat and time taken, usually it cools down very fast.

8.The solvent used in cut back bitumen is

a) Kerosene

b) Oil

c) Petrol

d) Diesel

View Answer

Answer: a
Explanation: The solvent mostly used in the cutback bitumen is kerosene, this bitumen is economical than others, oil petrol and diesel are inflammables so they should not be preferred.

9. The bitumen surface becomes stiff in

a) Summer

b) Winter

c) Rainy

d) Spring

View Answer

Answer: b
Explanation: The bitumen becomes softer in summer due to heating and stiffer in winter due to cooling.

10.Which bitumen does not need heating?

a) Paving grade

b) Cut back

c) Modified

d) Bitumen emulsion

View Answer

Answer: b
Explanation: The cutback bitumen which is the most economical type may or may not require heating, whereas the remaining required to be heated.

11.The distance between two samples in penetration test should be

a) 10mm

b) 15mm

c) 20mm

d) 25mm

View Answer

Answer: a
Explanation: The minimum distance between samples must be 10mm in penetration test, if it is less than 10 mm then there is no accurate value for penetration.

12. Which of the following grade of bitumen is harder?

a) 30/40

b) 60/70

c) 80/100

d) All are equal

View Answer

Answer: a
Explanation: Lesser the value of bitumen stiffer will be the bitumen, 30/40 is the least value, whereas 80/100 is the highest value, so it is the most soft bitumen.
advertisement

13.The temperature in penetration test is

a) 25

b) 30

c) 27

d) 35

View Answer

Answer: a
Explanation: The room temperature of the bitumen test is considered as 25 as per theory, practically it may not be possible, it may be 27 to 35 also in India.

14.The SI unit of viscosity is

a) Stoke

b) Pascal

c) Pascal second

d) Dynes

View Answer

Answer: c
Explanation: The SI unit of viscosity is Pascal second, Pascal is for pressure, Stoke is CGS unit, Dynes is also a CGS unit.

15. The softening point of bitumen in the given options (in degree Celsius) will be

a) 25

b) 30

c) 35

d) 80

View Answer

Answer: c
Explanation: The softening point of bitumen may be between 35 and 70 in most of the cases, so here 35 is the most appropriate.
Bituminuous Paving Mixes

1. Which layer of pavement should withstand stress?

a) Surface

b) Sub grade

c) Sub base

d) Base

View Answer

Answer: a
Explanation: The stresses and wheel load are to be transferred from pavement surface course to the soil sub grade, automatically the remaining three layers with stand the stress.

2. The surface of bitumen should be

a) Smooth

b) Rough

c) Sufficient enough to resist friction

d) Very smooth

View Answer

Answer: c
Explanation: The surface of bitumen should neither be smooth nor rough, it should have adequate frictional resistance.

3. The DBM is used in

a) Local streets

b) Rural roads

c) Highway

d) Concrete bridges

View Answer

Answer: c
Explanation: The DBM is a high quality bitumen mix used in highways and expressways, but they should fulfill some requirements to be used.

4. The filler material should pass from

a) 0.075mm

b) 0.75mm

c) 7.5mm

d) 75mm

View Answer

Answer: a
Explanation: The filler material should have 85 to 100 percent passing from 0.075mm sieve, then only it can be used in highway and express way.

5. Rutting may be avoided by

a) Good compaction

b) Good aggregate

c) Good filler

d) Good workmanship

View Answer

Answer: b
Explanation: The rutting is a problem caused in summer which can be avoided by using good aggregate, good filler and good compaction may not be enough, but good aggregate with good workmanship will be sufficient to avoid rutting.

6. Bleeding may be avoided by

a) Water voids

b) Air voids

c) Porosity

d) Water content

View Answer

Answer: b
Explanation: The bleeding may be avoided by providing sufficient air voids in the mix, as it is due to leakage of the water from the mix, if air voids are provided then first air escapes and then the water.

7. Which aggregate produce higher stability of mix?

a) Gravel

b) Sharp sand

c) Rounded sand

d) Fly ash

View Answer

Answer: b
Explanation: Sharp sand and crushed aggregate produce higher stable mix than gravel and round sand.

8. Maximum size of aggregate in base course is

a) 25 mm

b) 50 mm

c) 40 mm

d) 30 mm

View Answer

Answer: b
Explanation: The maximum size of aggregate in base course is 50mm, but 20 mm, 30 mm and 40 mm are also used extensively.

9. Maximum size of aggregate in surface course is

a) 18.5mm

b) 19.5mm

c) 20.5mm

d) 21.5mm

View Answer

Answer: a
Explanation: The maximum size in surface course of pavement is 18.5mm, as we move downward the size of the aggregate increases.

10. The specific gravity of bitumen lies between

a) 0.8& 0.9

b) 0.95& 0.97

c) 0.97&1.02

d) 1.02&1.05

View Answer

Answer: c
Explanation: The specific gravity of bitumen is between 0.97&1.02 which depends on the grade of bitumen.

11. Volume of mineral aggregate is

a) VV+VB

b) Vv-Vb

c) VV*Vb

d) VV/VB

View Answer

Answer: a
Explanation: The volume of aggregate is expressed as the sum of volume of voids and volume of bitumen.

12. The specified method for bitumen mix in India is

a) Hveem

b) Marshalls method

c) Hubbard method

d) Super paver mix method

View Answer

Answer: b
Explanation: Marshall's method has been specified by IRC and MORTH for bitumen mix design in India.

13. The temperature in Marshall's method is

a) 25

b) 30

c) 35

d) 60

View Answer

Answer: d
Explanation: The temperature in Marshall's design is taken as 60 for bitumen mix design purposes.

14. Marshall stability determines

a) Ductility

b) Flexibility

c) Utility

d) Grade of bitumen

View Answer

Answer: b
Explanation: Marshall's method is used to determine the flexibility of the given grade of bitumen.

15. The number of blows in Marshalls test specimen is

a) 25

b) 30

c) 55

d) 75

View Answer

Answer: d
Explanation: The number of blows to be given in Marshalls test specimen is 75 with a height drop of 457mm.
Portland Cement and Cement Concrete

1. The minimum grade of concrete in CC pavement is

a) M20

b) M30

c) M40

d) M50

View Answer

Answer: c
Explanation: The minimum grade of concrete required for pavement is M40, as it should withstand temperature and wheel stresses.

2. The cement used in water logged areas is

a) Portland cement

b) Hydrophobic cement

c) Quick setting cement

d) Reediest cement

View Answer

Answer: b
Explanation: The cement mostly used in water logged areas is hydrophobic cement as it will resist the water from clogging.

3. The waste material mostly used in pavement is

a) Fly ash

b) GGBS

c) Rice husk

d) Soil

View Answer

Answer: a
Explanation: The waste material mostly used in pavement is fly ash which is mostly obtained from thermal power plants.

4. The cement on touching should give

a) Cool feeling

b) Hot feeling

c) neutral

d) Very cool feeling

View Answer

Answer: a
Explanation: The cement on touching with hand should give a cool feeling and not break; it should be free from lumps.

5. Cement specific gravity is measured by

a) Water

b) Kerosene

c) Oil

d) Petrol

View Answer

Answer: b
Explanation: The specific gravity of cement is measured by kerosene, because if it is measured with water then it forms heat of hydration.

6. The specific gravity of cement is

a) 2.5

b) 1.44

c) 3.15

d) 30

View Answer

Answer: d
Explanation: The specific gravity of cement is 3.15, it is not like the density which is 1440 kg/m^3 because here kerosene is used for density test and in 1 metre cube of volume 30 bags may be filled.

7. One meter cube of cement consists of how many bags of cement?

a) 30

b) 50

c) 15

d) 10

View Answer

Answer: a
Explanation: One meter cube of volume contains 30 bags of cement or 1500kg of cement, it is actually an assumption that one kg of bag consists of 50 kg cement, but density is 1440kg/m3, so approximately value is 30, but the actual value is more.

8. The density of cement in Kg/m^3 is

a) 1440

b) 1240

c) 1340

d) 1540

View Answer

Answer: a
Explanation: The density of cement in Kg/m^3 is 1440; it is not 3150 because its specific gravity is measured with kerosene.

9. The initial setting time of cement is not less than

a) 30 seconds

b) 300 seconds

c) 30 minutes

d) 300 minutes

View Answer

Answer: c
Explanation: The initial setting time of cement is not less than 30 minutes for ordinary Portland cement and it may vary for various grades of cement.

10. The first test to be done for determining any property of cement is

a) Consistency

b) Setting time

c) Soundness

d) Fineness

View Answer

Answer: a
Explanation: The first test to be done for determining any property of cement is consistency test which lies between 27 and 29.

11. The volume of water in setting time test is

a) 0.78p

b) 0.75p

c) 0.85p

d) 0.95p

View Answer

Answer: c
Explanation: The volume of water in setting time test is 0.85p where p is the consistency of the cement sample.

12. The volume of water in soundness test is

a) 0.6p

b) 0.7p

c) 0.78p

d) 0.8p

View Answer

Answer: c
Explanation: The volume of water in soundness test is 0.78p, where p is the consistency of the cement sample.

13. The property of cement by which it doesn’t expand is called

a) Fineness

b) Soundness

c) Setting time

d) Consistency

View Answer

Answer: b
Explanation: The property of cement by which it doesn’t expand on contact with water is called as soundness.

14. The most commonly used grade of cement is

a) 33

b) 43

c) 53

d) 63

View Answer

Answer: c
Explanation: The most commonly used grade of cement is OPC 53 grade cement for most of the purposes, fly ash is also mixed in some cements.

15. The total grades of cement specified by IRC is

a) 3

b) 6

c) 9

d) 12

View Answer

Answer: c
Explanation: IS has classified the grades of cement depending upon the requirement into 9 categories of various classes and materials.

Design of Highway Pavements

1. The surface of highway pavement should be designed to allow

a) High rolling resistance

b) Low rolling resistance

c) No rolling resistance

d) Very high rolling resistance

View Answer

Answer: b
Explanation: The surface of highway pavement should be designed to allow no rolling resistance for safety purposes.

2. The soil becomes weak in

a) Summer

b) Winter

c) Rainy season

d) Spring season

View Answer

Answer: c
Explanation: The soil becomes weak in rainy season due to the absorption of water in the soil.

3. The pavement layer is considered superior if it distributes load like a

a) Point load

b) Uniformly distributed load

c) Uniformly varying load

d) Triangular load

View Answer

Answer: a
Explanation: The pavement layer is considered most superior if it distributes the load equally to all parts of pavement.

4. Which of the following pavement has greater life?

a) Bituminous pavements

b) Cement concrete pavements

c) Gravel roads

d) Earth roads

View Answer

Answer: b
Explanation: The cement concrete roads have a greater life than remaining all pavements which may last even up to 100 years.

5. Which of the following requirement is given most importance in highway design?

a) Structural

b) Functional

c) Seasonal

d) Maintenance

View Answer

Answer: a
Explanation: The structural design like highway speed, geometric design is given the most importance in design.

6. The surface of the pavement should be

a) Smooth

b) Rough

c) Sufficient enough to resist skid

d) Very rough

View Answer

Answer: c
Explanation: The surface of the pavement should be sufficient enough to resist the skid of vehicles by using friction.

7. Rough and uneven roads increase

a) Vehicle cost

b) Petrol cost

c) Accident cost

d) Vehicle operation cost

View Answer

Answer: d
Explanation: Roughness and uneven roads will increase the cost of vehicle operation and maintenance of vehicle cost.

8. The drainage layer is

a) Surface course

b) Sub base

c) Base

d) Sub grade

View Answer

Answer: b
Explanation: The drainage layer is the sub base layer which is used to collect the water from pavement surfaces to send to ground water.

9. The maximum stress sustained by concrete pavements in kg/cm2 is

a) 40

b) 45

c) 50

d) 55

View Answer

Answer: b
Explanation: The concrete pavements are designed to sustain a stress of 45Kg/cm2 which is the maximum limit.

10. The ICPB type of pavement uses

a) Concrete paver blocks

b) Fly ash

c) GGBS

d) RMC

View Answer

Answer: a
Explanation: The ICPB uses mostly interlocking concrete paver blocks for the construction of pavements.

11. The ICPB may be used in

a) Water logged areas

b) Parks

c) Footpaths

d) Highways

View Answer

Answer: a
Explanation: The inter locking concrete paver blocks may be used in water logged areas to absorb the water and send it to the ground water.

12. The design life of flexible pavement is

a) 12

b) 10

c) 8

d) 15

View Answer

Answer: d
Explanation: The design life of flexible pavement is considered as 15 years, it may last even further if properly maintained.

13. The design period of cement concrete road is taken as

a) 20

b) 25

c) 30

d) 35

View Answer

Answer: c
Explanation: The design period of cement roads is usually taken as 30 years but they can even last longer if properly maintained and designed.

14. In India the flexible pavement is designed as per

a) MSA

b) KSA

c) CSA

d) FSA

View Answer

Answer: a
Explanation: The flexible pavements are designed as per IRC 37 which uses MSA to specify the unit of the vehicles.

15. The maximum length of vehicle that can be used on Indian roads is

a) 11

b) 12

c) 13

d) 14

View Answer

Answer: b
Explanation: The maximum length of a vehicle in India is restricted as per the rotary design of highway which is maximum 12m.
Flexible Pavement-Components and their Functions

1. The most superior material is used in

a) base

b) sub base

c) surface

d) soil

View Answer

Answer: c
Explanation: The most superior material is used in the surface layer of pavement as it is the layer which is exposed to more number of stresses.

2. The soil sub grade suitable for pavement is

a) Gravel

b) Sand

c) Black cotton soil

d) Red soil

View Answer

Answer: a
Explanation: The soil sub grade most suitable for pavement layer is gravel as it is very strong rock, black cotton

is not suitable for pavement but suitable for crops, sand has a danger of liquefaction and red soil is not so advisable.

3. The drainage layer is

a) Sub grade

b) Sub base

c) Base

d) Surface

View Answer

Answer: b
Explanation: The drainage layer of the pavement is granular sub base course which collects water from pavement surfaces.

5. The minimum thickness of compacted sub grade is

a) 300 mm

b) 500 mm

c) 700 mm

d) 900 mm

View Answer

Answer: a
Explanation: The minimum thickness of sub grade required is 300mm and in highways it is 500 mm as they are provided with the maximum best facilities.

5. The most common test used in evaluating soil strength is

a) CBR

b) DCP

c) Triaxial

d) Plate bearing test

View Answer

Answer: a
Explanation: All the tests are performed but the most commonly used one is CBR, which is called as California bearing test, performed in India.

6. The CBR standard penetration is

a) 2.5 mm

b) 5.0 mm

c) 7.5 mm

d) 25mm

View Answer

Answer: a
Explanation: The standard penetration value of the CBR value is 2.5mm, if 5 mm value is greater then the penetration test is repeated again.

7. Minimum thickness of seal coat is

a) 20mm

b) 25mm

c) 30.m

d) 35mm

View Answer

Answer: a
Explanation : The minimum thickness of the seal coat required is 20mm for bitumen pavement, seal coat is a layer above the flexible pavement surface.
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8. The impact value of aggregate used in pavement is

a) 30

b) 40

c) 50

d) 60

View Answer

Answer: a
Explanation : The aggregate impact value should not be more than 30% for aggregate used in bitumen, if it is less than 30 the aggregate may be replaced.

9. The abrasion value of the aggregate in pavement should be less than

a) 30

b) 40

c) 50

d) 60

View Answer

Answer: b
Explanation: The abrasion value of aggregate should not be more than 40% for the aggregate tested by Los Angeles abrasion test, if it is more than 40, then it may be rejected.

10. The specifications for highway are prepared by

a) IRC

b) MORTH

c) BIS

d) NHAI

View Answer

Answer: b
Explanation: The specifications for the highway are prepared by MORTH, which is Ministry of Road Transport and Highway.
Factors Affecting Design and Performance of Flexible Pavements

1. The number of factors considered for flexible pavement is

a) One

b) Two

c) Three

d) Five

View Answer

Answer: d
Explanation: The design factors that are considered are wheel load, soil, climate, pavement layer, drainage.

2. The contact pressure is given by

a) Pa

b) a/P

c) P/A

d) PA

View Answer

Answer: c
Explanation: The contact pressure is given by P/A, where P is wheel load and A is area of contact.

3. The distribution of circular load was obtained by

a) Wester guard

b) Boussinesq

c) McAdam

d) Taylor

View Answer

Answer: b
Explanation: The stress distribution for the circular load was obtained by Boussinesq, in which he assumed homegenous and elastic material.

4. The last step in the design of flexible pavement is

a) Design of sub grade

b) Design of base

c) Design of mix

d) Design of the pavement thickness

View Answer

Answer: d
Explanation: The last step in the design of the pavement is design of pavement thickness, after design of mix, design of sub grade, sub base and base.

5. If one or more wheels act as a single load then it is called as

a) EASEL

b) EQWL

c) EQML

d) EQVL

View Answer

Answer: a
Explanation: If one or more wheels act as a single load then it is called as a equivalent single wheel load.

6. The pressure in pneumatic tyres should not exceed

a) $10Kg/cm^2$

b) $9.5Kg/cm^2$

c) $9Kg/cm^2$

d) 8Kg/cm^2

View Answer

Answer: b
Explanation: The maximum tyre pressure in pneumatic tyre is 9.5kg/cm^2.

7. The revised legal load of HCV in India in tonnes is

a) 8.17

b) 9.17

c) 10.2

d) 11.2

View Answer

Answer: c
Explanation: The maximum legal load in India is considered after revision as 10.2 tonnes, before it was 8.17 tonnes only.

8. The legal load considered in the benklemen beam method is

a) 8.17

b) 9.17

c) 10.2

d) 11.2

View Answer

Answer: a
Explanation: The maximum legal load in benklemen beam method is considered as 8.17 tonnes or 8170 kg.

9.The load dispersion is assumed at an angle of

a) 45°

b) 60°

c) 75°

d) 90°

View Answer

Answer: a
Explanation: The angle of the dispersion is assumed as 45° in the ESWL for the ease of construction and calculation.

10. The equivalent wheel load factors are calculated by using

a) First power law

b) Second power law

c) Third power law

d) Fourth power law

View Answer

Answer: d
Explanation: The load factor follow the fourth power law for the calculation of VDF and load factor.

11. The standard wheel load in Ewl factor is

a) 4080 kg

b) 9160 kg

c) 8170 kg

d) 5100 kg

View Answer

Answer: a
Explanation: The load is considered for only one wheel which is 4080kg, it is considered as the half of the legal load.

12. The rate of growth in traffic in urban areas is assumed as

a) 7.5%

b) 8.0%

c) 8.5%

d) 9.0%

View Answer

Answer: a
Explanation: The rate of growth in traffic for urban areas is assumed as 7.5%, it may also vary depending on the requirement.

13. The constant value used in calculation of CSA is

a) 365

b) VDF

c) LDF

d) N

View Answer

Answer: a
Explanation: Except the value of 365, all the other constant vary depending on the lane, vehicle and traffic.

14. The presence of moisture content causes

a) Swelling

b) Shrinkage

c) Alternate swelling and shrinkage

d) Frost

View Answer

Answer: a
Explanation: The presence of moisture content in any water absorbed soil causes the swelling of soil and ultimately gives rise to cracks.

15. Which frost heave is dangerous?

a) Unlike frost heave

b) Like frost heave

c) Uneven frost heave

d) Even frost heave

View Answer

Answer: The frost heave which is caused in cold temperatures raises the edges of the pavement, if they are uneven then it is very dangerous.

Stresses in Flexible Pavements

1. Boussinesq assumed soil as

a) Homogeneous

b) Heterogeneous

c) Rigid

d) Flexible

View Answer

Answer: a
Explanation: The assumption by Boussinesq was the soil is homogeneous, elastic and isotropic under a circular load.

2. Two elastic theory was developed by

a) Boussinesq

b) Westergard

c) Burnister

d) McAdam

View Answer

Answer: c
Explanation: The two elastic theory was developed by Burnister after Boussinesq developed the equation for evaluation of stress.

3. Boussinesq assumed the load as a

a) Point load

b) UDL

c) UVL

d) Triangular load

View Answer

Answer: a
Explanation: Boussinesq assumed the load as a single point load acting at a depth z and radius r.

4. The ratio of z/a=0 represent the stress at

a) Top surface

b) Bottom surface

c) Middle

d) Maximum stress point

View Answer

Answer: a
Explanation: The depth is zero, so the stress represented is at the surface of the pavement.

5. The z is a function of

a) P, a

b) P,z

c) P,a,z

d) P only

View Answer

Answer: c
Explanation: The depth is a function of the stress, depth and radius of the load acting on the point.

6. The ratio of the radius r/a=0 represents

a) Center of chart

b) Center of load

c) Center of stress

d) Center of the pavement

View Answer

Answer: a
Explanation: The radius is zero so it is possible only in a chart, which represents a point in the center of the chart.

7. The Poisson's ratio of soil is assumed as

a) 0.5

b) 0.6

c) 0.7

d) 0.8

View Answer

Answer: a
Explanation: The Poisson's ratio for a homogeneous soil is assumed as 0.5.

8. At surface the value of constant F is

a) 1

b) 1.18

c) 1.5

d) 2

View Answer

Answer: c
Explanation: The value of the constant F in finding out the deflection is 1.5.

9.The unit of deflection is measured in

a) mm

b) N mm

c) joule

d) watt

View Answer

Answer: a
Explanation: The deflection is measured in mm, cm or m depending on the requirement of the pavement.

10. The constant in rigid pavement design is

a) 1.5

b) 1.18

c) 2

d) 3

View Answer

Answer: b
Explanation: The constant value of the pavement in rigid pavement design is assumed as 1.18.

11. The diameter of the plate in plate load test is

a) 30 cm

b) 30 mm

c) 3 m

d) 0.3 m

View Answer

Answer: a
Explanation: The diameter of plate used in plate bearing test is 30 cm, it is a rigid plate.

12. The minimum deflection assumed in plate bearing test is

a) 0.25 mm

b) 0.25 cm

c) 2.5 cm

d) 2.5 m

View Answer

Answer: b
Explanation: The deflection is usually fixed in plate bearing test and it varies between 0.25 cm and 0.5 cm.

13. The layer which should have high modulus of elasticity is

a) Soil

b) Sub grade

c) Sub base

d) Pavement

View Answer

Answer: d
Explanation: The modulus of elasticity should increase as the pavement layer increase from bottom to top.

14. The most superior material used in pavement is

a) DBM

b) WBM

c) Tar

d) Bitumen

View Answer

Answer: d
Explanation: The most superior material used in pavement is bitumen which is mostly used for the surface layer.

15. In which layer system the modulus of elasticity will be equal for all layers?

a) Single

b) Double

c) Triple

d) Four layer

View Answer

Answer: a
Explanation: In the single layer of system all the layers have same modulus of elasticity which means it is covered with only one material.

Flexible Pavement Design Method – 1

1. How many types of methods are there to design a flexible pavement

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: There are three types of methods to design a flexible pavement they are empirical, semi empirical and theoretical method.

2. Empirical method is dependent on strength of

a) Soil

b) Sub base

c) Base

d) Surface

View Answer

Answer: a
Explanation: The strength of the soil sub grade is used to design the flexible pavement, because the sub base and base are more stronger than the sub grade, so design depends on sub grade only.

3. The stress strain approach is used in

a) Empirical method

b) Semi empirical method

c) Theoretical

d) CBR method

View Answer

Answer: b
Explanation: The design of pavement using stress strain approach is used in semi empirical method, which depends both on theory and graph.

4. CBR is a

a) Measure of soil strength

b) Flexible pavement design method

c) Rigid pavement design method

d) Measure of soil characteristics

View Answer

Answer: b
Explanation: CBR is a method of designing the flexible pavement by using the soil characteristics.

5. The design charts are prepared based on

a) Climate

b) Past experience

c) Location

d) Traffic

View Answer

Answer: b
Explanation: The design charts are prepared based on the past experience hence they are not reliable, as it changes according to location.

6. For which material the semi empirical method is useful?

a) Elastic

b) Plastic

c) Rigid

d) Semi rigid

View Answer

Answer: a
Explanation: If the material is elastic, then it will obey hookes law, so after that limit it is not so useful.

7.The CBR method was developed by

a) California division of highway

b) IRC

c) MORTH

d) NHAI

View Answer

Answer: a
Explanation: In 1925, the California division of highway designed the CBR method for design of flexible pavement.

8.The soaking period in CBR sample is

a) 2 days

b) 3 days

c) 4 days

d) 5 days

View Answer

Answer: c
Explanation: The soaking period usually specified is four days which may not be sufficient for some highways.

9. The total thickness of pavement

a) Constant

b) Changes with sub grade

c) Changes with sub base

d) Changes with base

View Answer

Answer: a
Explanation: The total thickness of the pavement remains constant as it does not depend on the number of layers.

10.As per MORTH the specified compaction of density is

a) 95%

b) 96%

c) 100%

d) 99%

View Answer

Answer: c
Explanation: MORTH recommends a field density of 97% for heavy compaction, in some cases it recommended even 99 or 100% of lab density.

11. The top 500mm of soil sub grade should be compacted at

a) OMC

b) MDD

c) Dry density

d) Saturated density

View Answer

Answer: a
Explanation: The top 500mm layer in the soil sub grade should be compacted at OMC, to obtain M.D.D, only at M.D.D the soil gets its maximum strength.

12. For how much amount of rainfall soaking of specimen is not required?

a) 100 mm

b) 200 mm

c) 300 mm

d) 500 mm

View Answer

Answer: d
Explanation: For a rainy area which is having an amount of rainfall more than 500 mm, then soaking of specimen is not required.

13.Maximum aggregate size in CBR method is

a) 20 mm

b) 30 mm

c) 40 mm

d) 50 mm

View Answer

Answer: a
Explanation: The maximum size of aggregate should be 20 mm in the design of flexible pavement if it is more than 20 mm then above layers are not valid.

14. The critical stress is considered in

a) Surface

b) Sub base layer

c) Sub grade

d) Both sub grade and surface

View Answer

Answer: d
Explanation: Both horizontal stress and vertical stress are considered for flexible pavement and measured at these two layers.

15. The design factor not considered in CBR is

a) Weather

b) Traffic

c) VDF

d) Growth rate

View Answer

Answer: a
Explanation: The weather factor is not considered in CBR method as it keeps changing frequently, growth rate keeps increasing, VDF is a constant so climate doesn't actually affect the CBR.

Flexible Pavement Design Method – 2

1. The heavy commercial vehicles are considered if their weight exceeds

a) 3.0 t

b) 4.0 t

c) 5.0 t

d) 6.0 t

View Answer

Answer: a
Explanation: The HCV are used to study the pavement design if their weight exceeds 3 tonnes.

2. Axle load studies are carried out on a minimum sample of

a) 10%

b) 15%

c) 20%

d) 25%

View Answer

Answer: c
Explanation: The minimum sample size of axle load considered in India is 20%.

3. The overlay design is laid for a maximum life span of

a) 5 years

b) 7 years

c) 9 years

d) 10 years

View Answer

Answer: d
Explanation: The maximum life span of an overlay design is 10 years, it may be also 5 years for small roads.

4. The most commonly used overlay is

a) Flexible over rigid

b) Rigid over flexible

c) Flexible over flexible

d) Rigid over rigid

View Answer

Answer: c
Explanation: The most commonly used overlay is flexible over flexible, rigid over flexible and rigid over rigid are also used but flexible is the most preferred and used pavement.

4. The average vehicles considered for pavement studies are

a) 150

b) 1500

c) 150 to 1500

d) 15000

View Answer

Answer: c
Explanation: The commercial vehicles per day are considered as 150 to 1500 for pavement design studies.

5.The VDF of a lane if the CVPD is greater than 1500 in plain terrain

a) 4.5

b) 2.5

c) 3.0

d) 4.0

View Answer

Answer: a
Explanation: The VDF in plain terrain is 4.5 if the CVPD is greater than 1500, it mainly depends on the commercial vehicle and terrain.

6. The VDF in hilly terrain for CVPD less than 1500 is

a) 1

b) 1.5

c) 2.0

d) 2.5

View Answer

Answer: b
Explanation: The VDF in hilly terrain is less than that in plain and rolling terrain so it is 1.5, because hill roads don’t have traffic as plain terrain.

7.The depth of rutting criterion is obtained by

a) Micro strain

b) Macro strain

c) Traffic

d) Elasticity modulus

View Answer

Answer: a
Explanation: Based on research the rutting criterion depends on the vertical strain on sub grade, which is responsible for developing cracks.

8. The lane distribution factor on undivided roads with single lane carriage way is

a) 0.5

b) 1

c) 1.5

d) 2

View Answer

Answer: b
Explanation: The lane distribution factor is assumed as 1 on an undivided road with single carriage way.

9.The least lane distribution factor value is least for

a) Single lane

b) Double lane

c) Three lanes

d) Four lanes

View Answer

Answer: d
Explanation: The least lane distribution factor is least for four lane highway which is 0.45, because any vehicle can move in it’s own lane and is independent so it is less.

10. The joint filling sand should have fines

a) 75 microns

b) 85 microns

c) 95 microns

d) 100 microns

View Answer

Answer: a
Explanation: The joint filling sand should have passed 2.36 mm and fines should pass 75 microns to be used in highway construction

Rigid Pavements-Components and their Functions

1. The PQC denotes

a) Paved quality cement

b) Paved quality concrete

c) Pavement quality concrete

d) Paved quantity cement

View Answer

Answer: c
Explanation: The PQC denotes the pavement quality concrete which is used in rigid pavement.

2. The layer not required in cement road is

a) Sub grade

b) Sub base

c) Base

d) Surface

View Answer

Answer: c
Explanation: The base course may be required but in cement road it is not mandatory, it is better if it is provided.

3. The cement slab is provided with

a) Long joints

b) Longitudinal joints

c) Transverse joints

d) Both Longitudinal and transverse joints.

View Answer

Answer: d
Explanation: A cement slab is provided with both the longitudinal and transverse joints in both the direction as a slab is not laid at a stretch, it may be useful for identification.

4. The soil sub grade design is done by

a) Plate bearing test

b) CBR

c) Plate load test

d) Shear test

View Answer

Answer: a
Explanation: The most commonly used test is plate bearing test which was developed by Westergard.

5.Failure in rigid pavement occurs due to

a) More compaction

b) Less compaction

c) More load

d) Less load

View Answer

Answer: b
Explanation: The greater compaction effort does not lead to any loss but if the compaction is less then there may be a failure.

6.The size of particles preferred in GSB layer of pavement is

a) 0.075 mm

b) 0.150 mm

c) 0.300 mm

d) 0.600 mm

View Answer

Answer: a
Explanation: The size of aggregate used in pavement GSB layer should be 0.075mm and have 5% fines.

7. The failure in GSB layer of rigid pavement is

a) Pumping

b) Blowing

c) Pumping and blowing

d) Fatigue

View Answer

Answer: c
Explanation: The most commonly found failure in the GSB layer is pumping and blowing, these failure mainly take place due to the water.

8. The drainage layer of pavement can

a) Increase the pavement life

b) Decrease the pavement life

c) Increase the pavement thickness

d) Decrease the pavement thickness

View Answer

Answer: a
Explanation: The pavement thickness is constant and does not depend on granular sub base layer and if maintained properly it can increase the life span.

9. The base course uses

a) RCC

b) Wet lean concrete

c) Dry lean concrete

d) Heavy weight concrete

AView Answer

nswer: c
Explanation: The most commonly used concrete for base is high quality concrete of lean concrete.

10.The spacing between construction joints in rigid pavement is

a) 4.5 m

b) 5.0 m

c) 5.5 m

d) 6.0 m

View Answer

Answer: b
Explanation: The spacing between construction joints in rigid pavement is formed for expansion and contraction of pavement which is 5.0 m.
Factors affecting Design and Performancee of CC pavements

1.The gap provided in slabs is

a) 20 mm

b) 30 mm

c) 35 mm

d) 40 mm

View Answer

Answer: a
Explanation: The slabs are provided with a gap of usually 20 mm for expansion in summer season.

2. The stress in pavement changes

a) Daily

b) Seasonally

c) Annually

d) Depends on pavement

View Answer

Answer: a
Explanation: The stress in pavement changes daily according to the temperature on surface, actually it changes every minute but we can't calculate it for every minute so assumption is taken it changes daily.

3. The spacing of joint depends on

a) Type of joint

b) Type of construction

c) Type of material

d) Same for all joints

View Answer

Answer: a
Explanation: The spacing between the two joints depends on the type of joint, it may be 4.5 m for longitudinal and 3.5 m for transverse joint.

4. How many factors contributing to the flexural stress of a pavement?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The most influence factors are wheel load and temperature stress in rigid pavement.

5. The life span of rigid pavement depends on

a) Magnetic action

b) Frictional action

c) Location of loading

d) Seasonal change

View Answer

Answer: c
Explanation: The life span of most of the pavement is dependent on the location of loading of the wheel.

6. The term ‘a’ denotes

a) Radius of wheel

b) Radius of the area of contact

c) Radius of the equivalent area of contact

d) Radius of axle

View Answer

Answer: c
Explanation: The term ‘a’ denotes the radius of equivalent area of contact, which indicates the value of the radius of wheel in which that is in contact.

7. The stresses are found in how many places of rigid pavement?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The stresses are found in three parts of pavement they are interior, edge and corner.

8. The maximum fatigue ratio of rigid pavement is

a) 0.45

b) 0.65

c) 0.8

d) 0.9

View Answer

Answer: d
Explanation: For a rigid pavement the fatigue ratio of the pavement is 0.45 to 0.9, in any case the value should not exceed 0.9.

9. The ratio of flexibility strength applied due to a load and the flexural stress is called

a) Stress ratio

b) Strain ratio

c) Stress and strain ratio

d) Bulk modulus

View Answer

Answer: a
Explanation: The ratio of flexibility strength due to a load and it’s original flexural strength is called stress ratio.

10. There will be no fatigue if stress ratio is kept below

a) 0.44

b) 0.50

c) 0.70

d) 0.9

View Answer

Answer: a
Explanation: If the stress ratio is kept below 0.44, then there is no chance of fatigue, so the pavement is designed at a stress ratio of less than 44%.

11. The design load is taken as

a) 15th percentile load

b) 85th percentile load

c) 98th percentile load

d) 99th percentile load

View Answer

Answer: c
Explanation: The load considered is 98th percentile load which is exceeded only by 2.0% of vehicles.

12. The load safety factor assumed is

a) 1

b) 1.2

c) 1.5

d) 1.6

View Answer

Answer: b
Explanation: The load safety factor is assumed as 1.2 for HCV, it may be even higher if it is a undivided pavement.

13. No warping stress is developed if temperature

a) Constant

b) Less than normal

c) More than normal

d) Changes frequently

View Answer

Answer: a
Explanation: The temperature must remain same at both top and bottom of the slab to prevent warping stress.

14. Proximity to sea contributes to

a) Warping stress

b) Seasonal stress

c) Climatic factor

d) Weathering factor

View Answer

Answer: c
Explanation: The proximity to sea contributes to the corrosion which is considered as a factor in the climate changes.

15. The maximum stress in summer by pavement is experienced at

a) Morning

b) Mid noon

c) Evening

d) Night

View Answer

Answer: b
Explanation: The most worst stress is experienced in pavement at mid noon usually in summer it is very high.
Stresses in Rigid Pavements

1. Major stresses in CC pavement is

a) Wheel load stress

b) Warping stress

c) Wheel load and warping stress

d) Frictional stress

View Answer

Answer: c
Explanation: The major stress is caused due to wheel load and temperature, remaining all are the minor stresses.

2. The unit of 'K' is

a) Kg

b) Kg/cm

c) Kg/cm^2

d) Kg/cm^3

View Answer

Answer: d
Explanation: The modulus of sub grade reaction is the pressure per deflection unit, it was obtained by Westrergaard for deflection analysis.

3. The deflection in Westergaard analysis is

a) 0.125

b) 0.250

c) 0.375

d) 0.500

View Answer

Answer: a
Explanation: The deflection is assumed as 0.125 in Westergaard analysis, it is constant value for the deflection for modulus of sub grade reaction.

4. The Poisson's ratio of concrete is

a) 0.15

b) 0.3

c) 0.6

d) 1.1

View Answer

Answer: a
Explanation: The Poisson’s ratio of concrete is mostly assumed as 0.15 however it may lie between 0.13 and 0.15.

5. The deflection of slab is dependent on

a) Flexural strength

b) Compressive strength

c) Tensile strength

d) Roughness

View Answer

Answer: a
Explanation: The deflection is dependent on the flexural strength of the material on how it breaks.

6. The stiffness of slab mainly depends on

a) Radius of wheel

b) Radius of rotary

c) Radius of relative pavement

d) Radius of relative pavement

View Answer

Answer: d
Explanation: The radius of relative stiffness mainly depends on the soil sub grade reaction.

7.If any load is placed at interior away from all edges then it is called

a) Edge loading

b) Far edge loading

c) Interior loading

d) Exterior loading

View Answer

Answer: c
Explanation: The loading that takes place inside of the pavement away from all edges is called as interior loading.

8. The loading which does not exist is

a) Edge

b) Interior

c) Exterior

d) Corner

View Answer

Answer: c
Explanation: The loading that doesn’t exist is exterior loading because a load cannot be outside of pavement.

9. The distance at which the crack is developed is given by

a) 2.58 al

b) 2.58(al)

c) 1.58al

d) 0.58al

View Answer

Answer: b
Explanation: The distance is given by the equation 2.58al, where a is the radius of wheel distribution and l is radius of relative stiffness.

10. Warping stress coefficient charts were prepared by

a) Burnister

b) Telford

c) Bradbury

d) IRC

View Answer

Answer: c
Explanation: The charts were prepared by Bradbury, assuming it depends on seasonal coefficient and radius of relative stiffness.

Rigid Pavement Design Methods

1. Based on topography and climate of the location which factor is estimated?

a) Temperature

b) Pavement quality

c) Pavement thickness

d) Pavement design method

View Answer

Answer: b
Explanation: The thickness is the most important factor that is designed as per requirement, pavement quality and pavement method are indirectly dependent on pavement design.

2. The warping stress is dependent on

a) Length of slab

b) length and width of slab

c) Thickness of slab

d) Water content in slab

View Answer

Answer: The warping stress is due to the variation in the temperature of the pavement depends on length and width.

3. The first thickness assumed in pavement is called

a) IRC thickness

b) MORTH thickness

c) Trial thickness

d) Estimated thickness

View Answer

Answer: c
Explanation: The first thickness is assumed as a trail thickness, it may be later revised after design.

4. The factor of safety is the stress caused at

a) Mid day

b) Summer

c) Winter

d) Rainy

View Answer

Answer: a
Explanation: The stress caused is measured at the mid day due to wheel load and temperature stress.

5. The minimum factor of safety for rigid pavement is

a) 1

b) 1.1

c) 1.5

d) 1.7

View Answer

Answer: b
Explanation: The minimum factor of safety is 1.1 and if it doesn't satisfy then the pavement thickness is revised.

6. The Westergaard equation was modified by

a) Bradbury

b) Burnister

c) Teller and Sutherland

d) Telford

View Answer

Answer: c
Explanation: The Westergaard analysis gave low stress results so it was modified by Teller and Sutherland at edge.

7. If the flexural strength of a pavement is 45 and it's stress is 40 then factor of safety is

a) 1

b) 1.1

c) 1.15

d) 1.2

View Answer

Answer: c
Explanation: The ratio of the flexural strength to total flexural stress is called as factor of safety.

9. The pavement thickness is usually assumed in rigid pavement as

a) 20 cm

b) 25 cm

c) 30 cm

d) 35 cm

View Answer

Answer: b
Explanation: The trail thickness usually assumed in rigid pavement is 25 cm , if it doesn’t satisfy then the pavement thickness is revised.

10. The temperature differential in coastal regions in India for a thickness of 25 cm is

a) 15

b) 16.2

c) 17

d) 18

View Answer

Answer: b
Explanation: The temperature differential in coastal regions in India is assumed as 16.2 degrees centigrade as recommended by IRC.

11. The minimum quality of thickness in the low volume roads is

a) 15

b) 20

c) 25

d) 35

View Answer

Answer: d
Explanation: The minimum grade required is M 40 but for low volume roads M 30 roads can be used.

12. The cement concrete roads are designed with

a) Plain concrete

b) RCC

c) ICPB

d) Bitumen

View Answer

Answer: a
Explanation: The cement slab is provided with dowel bars but it’s not considered as reinforced concrete.

13. The dowel bars are provided

a) Longitudinally

b) Laterally

c) Any directoion required

d) In base of pavement

View Answer

Answer: a
Explanation: The dowel bars are provided mostly in longitudinal direction to prevent movement of pavement.

14. The minimum diameter of dowel bar used is

a) 25 mm

b) 35 mm

c) 40 mm

d) 50 mm

View Answer

Answer: a
Explanation: The minimum diameter of dowel bar used in pavement for load transfer is 25 mm.

15. The dowel should transfer

a) 40% of safe load

b) 40% of design load

c) 45% of safe load

d) 45% of design load

View Answer

Answer: b
Explanation: The dowels are designed in such a way that it should be able to transfer 40% of the design axle load.

General Features of Highway Construction

1. The first step in highway construction after paper work is

a) Surveying

b) Estimation

c) Bill of quantities

d) Evaluation

View Answer

Answer: a
Explanation: The first step after the office work in the highway design is surveying , after surveying the design is approved.

2. The design of the highway should satisfy

a) Structural requirement

b) Drainage system

c) Economical

d) All the above mentioned

View Answer

Answer: d
Explanation: The design of highway should satisfy economy, drainage and structural requirement.

3. The economical highway can be achieved by

a) Cheap aggregate

b) Good quality aggregate

c) Good aggregate and less transport cost

d) More transport cost and less quality aggregate

View Answer

Answer: c
Explanation: The maximum cost of aggregate doesn’t affect the highway cost, it is th the transport cost which has a greater effect.

4. The embankment is constructed by using

a) Soil

b) Fly ash

c) GGBS

d) Bricks

View Answer

Answer: a
Explanation: The soil embankment is constructed by using the locally available soil , if not satisfied we can replace it by stronger soils.

5. The embankment construction should always be

a) Above MSL

b) At MSL

c) Above HFL

d) below MSL

View Answer

Answer: c
Explanation: The embankment should always be constructed above HFL, as it may effect the pavement when floods occur if laid above MSL.

6. The part of pavement left over for drainage is called

a) Sub base

b) Footpath

c) Ken

d) Shoulder

View Answer

Answer: d
Explanation: The part which is left over for the water to drain off is called as shoulder, it may be paved or unpaved.

7. The raise of ground water reduces the capacity by

a) 66.66%

b) 51.33%

c) 50%

d) 75%

View Answer

Answer: c
Explanation: If the ground water raises to ground level, then the bearing capacity of the soil sub grade reduces to 50%.

8. Embankment are laid

a) Above ground level

b) Below ground level

c) 3.0 m above ground level

d) 5.0m above foundation level

View Answer

Answer: b
Explanation: Most of the embankments are laid below the ground level by cutting and then filling.
Embankment and Subgrade

1. The last step in design of embankment is

a) Height

b) stability of slope

c) Stability of foundation

d) Settlement

View Answer

Answer: b
Explanation: After the highway embankment construction, the stability of slope should be checked, settlement takes place after a few days and height is checked in design itself.

2. If the height of embankment increases

a) Slope stability increases

b) Slope stability remains constant

c) Slope has to reduced

d) Slopes need to be flattered

View Answer

Answer: d
Explanation: The slopes need to be flattered if the embankment height is increased, if the embankment height is small then slope may be kept constant.

3. The fill material used in embankment is

a) Peat

b) Silt

c) Clay

d) Granular soils

View Answer

Answer: d
Explanation: The granular soil with less plasticity are more preferable in filling material.

4. The settlement is due to

a) More compaction

b) Inadequate compaction

c) Temperature

d) Air pressure

View Answer

Answer: b
Explanation: The settlement is due to the inadequate compaction effort which leads to excess settlement.

5. The stability of foundation is checked to ensure

a) Lateral strength

b) Compressive strength

c) Shear strength

d) Tensile strength

View Answer

Answer: c
Explanation: The stability of the foundation is checked to ensure the soil satisfies the shear strength requirement.

6. Stability of slopes change with

a) Climate

b) Increase in load

c) Increase in soil

d) Increase in width of pavement

View Answer

Answer: b
Explanation: The stability of slope mostly depends on the type of load if it changes the stability requirement will also change.

7. An embankment is classified as high if height exceeds

a) 3.0 m

b) 4.0 m

c) 5.0 m

d) 6.0 m

View Answer

Answer: c
Explanation: The embankment is classified as a high embankment if height exceeds 5.0m, if it is less than 5.0 m they may be medium height or small height embankments.

8. The most common natural problem found in embankment is

a) Settlement

b) Stability of foundation

c) Stability of slope

d) Soil erosion

View Answer

Answer: d
Explanation: All the problems are encountered by a highway engineer but soil erosion is a natural problem which cannot be avoided.

9. The investigation of embankment should be carried out for

a) Twice the height of embankment

b) Thrice the height of embankment

c) Exact height of embankment

d) Half height of embankment

View Answer

Answer: a
Explanation: The investigation of the embankment should be carried out at twice height of embankment below the ground level.

10. The consolidation can be achieved faster by

a) Clay

b) Peat

c) Sand drains

d) Sand filter

View Answer

Answer: c
Explanation: The Sand drains are a type of drainage system which is used to accelerate the consolidation.

11. The minimum spacing between the two sand beds is

a) 1.0 m

b) 1.5 m

c) 2.0 m

d) 2.5 m

View Answer

Answer: d
Explanation: The minimum spacing between the two sand beds may be 2.5 m and maximum is 6.0 m.

12. The liquid limit of soil for embankment construction is

a) Less than 70%

b) Less than 90%

c) Less than 60%

d) Less than 45%

View Answer

Answer: a
Explanation: The minimum liquid limit should be less than 70% for embankment construction.

13. The free swelling index of soil should be less than

a) 50

b) 60

c) 70

d) 80

View Answer

Answer: a
Explanation: The free swelling index of the soil should be less than 50% for the soil for good embankment.

14. The plasticity index for a sub grade should be less than

a) 45

b) 35

c) 25

d) 15

View Answer

Answer: c
Explanation: The plasticity index for a sub grade should be less than 25 for embankment construction.

15. The rollers that uses both tamping and kneading is

a) Plain roller

b) Vibratory roller

c) Sheep foot roller

d) Pneumatic roller

View Answer

Answer: c
Explanation: The sheep foot roller can use both the procedure of tamping and kneading that is done by using a roller that resemble the paw of a sheep.

Excavation of Earth

1. The removal of earth for highway formation is

a) Embankment

b) Sub grade

c) Excavation

d) Filling

View Answer

Ans : c
Explanation: The process of removal of earth for construction is called excavation, it may be done by manual or machine.

2. The best time to remove soil is during

a) Summer

b) Winter

c) Rainy season

d) During storm

View Answer

Answer: a
Explanation: The best time to remove soil is during summer, if it is removed in winter there may be chances of rain so it’s better to remove in summer.

3. The equipment used for short haul distance of 100 m is

a) Bulldozer

b) Scrapper

c) Power shovel

d) Hoe

View Answer

Ans: a
Explanation: The bulldozer is a versatile earth equipment used for a short distance of 100m, if it exceeds 100 m other equipment can also be used.

4.The blade angle of bulldozer is usually

a) 60

b) 90

c) 15

d) 45

View Answer

Answer: b
Explanation: The blade angle of a bulldozer is usually kept perpendicular, which is always 90 degrees to the soil.

5.The precise control of excavation is possible by

a) Scrapper

b) Hoe

c) Shovel

d) Bulldozer

View Answer

Answer: a
Explanation: The precise control of the excavation is possible by scrapper, but they can’t be used for greater depth.

6. The boom is supported by

a) Cab

b) Dipper stick

c) Hoist line

d) Crawler

View Answer

Answer: c
Explanation: The hoist line gives the support to boom which is attached to the cab, cab is the place where controls are placed and boom is the support.

7.Dragline cannot excavate

a) Soft rocks

b) Black cotton soil

c) Clay

d) Stiff material

View Answer

Answer: d
Explanation: The dragline can’t exert high pressure and remove stiff materials, it can remove only soft rocks.

8. The stiff materials can be excavated by

a) Dragline

b) Hoe

c) Power shovel

d) Scrapper

View Answer

Answer :b
Explanation: How is one equipment which can exert high tooth pressure and excavate stiff materials from ground.

9. The equipment having a bucket is

a) Shovel

b) Clam shell

c) Dragline

d) Hoe

View Answer

Answer: b
Explanation: A clam shell consists of a bucket which is used to carry soil or any other material from a greater depth.

10. The compaction of sand is done by

a) Rollers

b) Animals

c) Vibrator

d) Jetting

View Answer

Answer: d
Explanation: The jetting of the sand cannot be done by using roller or vibrator, it requires effective techniques like jetting and pounding with water.
Construction of Flexible Pavements

1. The loss with sodium sulphate cycles for aggregate used for bitumen is

a) Less than 12%

b) Less than 15%

c) Less than 16%

d) Less than 20%

View Answer

Answer: a
Explanation: The loss of sodium sulphate with cycles should be less than 12% for aggregates used in bitumen binder.

2. How many kg of binder is applied for $10m^2$ area?

a) 68 kg

b) 71 kg

c) 82 kg

d) 93 kg

View Answer

Answer: a
Explanation: The minimum amount of binder to be applied depends on the thickness of the bitumen layer and it is 68 kg for 10 m^2 area.

3. Built up spray grout consists of

a) One layer

b) Two layers

c) Three layers

d) Indefinite layers

View Answer

Answer: b
Explanation: Built up spray grout consists of two layers with crushed aggregate and bituminous binders.

4. The stripping of aggregate should be less than

a) 12

b) 25

c) 35

d) 45

View Answer

Answer: b
Explanation: IRC recommends a value of 25% for aggregates to be used in highway construction.

5. The camber is checked at every interval of

a) 10 m

b) 20 m

c) 30 m

d) 40 m

View Answer

Answer: a
Explanation: The highway cambers should be checked at every interval of 10 m for every 10 metre square area.

6. The minimum thickness used in bituminous macadam is

a) 25 mm

b) 50 mm

c) 75 mm

d) 100 mm

View Answer

Answer: c
Explanation: The pavement used in bituminous Macadam is usually of a thickness of 50mm and maximum is 100 mm.

7. The interface bond between existing pavement and new pavement is provided by

a) Tack coat

b) Prime coat

c) Bitumen

d) Oil

View Answer

Answer: a
Explanation: The interface between the existing pavement and new pavement can be provided by using tack coat.
advertisement

8. The spreading test performed on bitumen can be checked on metal plates of dimensions

a) 200*200mm

b) 300*300mm

c) 400*400mm

d) 500*500mm

View Answer

Answer: a
Explanation: The test can be performed by metal plates of 200*200mm placed at 10m intervals.

9. The water sensitivity of aggregates should retain

a) 75% of tensile strength

b) 80% of tensile strength

c) 95% of tensile strength

d) 100% of tensile strength

View Answer

Answer: b
Explanation: The water sensitivity for aggregates used should retain 80% of tensile strength.

10. The polished stone value for aggregate of surface course should be more than

a) 15

b) 25

c) 35

d) 55

View Answer

Answer: d
Explanation: The polished stone value required for surface of aggregate is more than 55, it depends on the type of stone used.

Cement Concrete Pavements

1. The most commonly used type of concrete pavement is

a) Unreinforced

b) RCC

c) Fibre reinforced

d) Contnous

View Answer

Answer: a
Explanation: The most commonly used type is unreinforced, dowels and ties are not considered as reinforcements in slab.

2. The pavement is checked for

a) Tension

b) Shear

c) Flexure

d) Compression

View Answer

Answer: c
Explanation: The pavement is checked for flexure, because it is the factor which leads to cracks.

3. The maintenance cost of rigid pavement when compared to flexible pavement is

a) More

b) Less

c) Equal

d) Depends on grade of concrete

View Answer

Answer: b
Explanation: The cost of maintenance for rigid pavement is always less than that for a flexible pavement.

4. The critical stresses affecting the reinforced pavement is

a) Heavy loading

b) Poor soil

c) Poor drainage

d) Combination of above all

View Answer

Answer: d
Explanation: The extreme conditions are due to all the factors, but when they are combined the worst may occur.

5. The steel reinforcement is placed at

a) 1/2 of depth

b) 1/3 of depth

c) 1/4 of depth

d) 1/6 of depth

View Answer

Answer: a
Explanation: The steel reinforcement is usually provided at half or a little more than half of depth.

6. The excessive flexural stress can lead to

a) Cracks

b) Bending

c) Torsion

d) Settlement

View Answer

Answer: a
Explanation: The bending can resist a maximum flexural stress and if it exceeds it leads to cracks.

7. The CC slab can be constructed in how many methods?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: CC pavement can be constructed by using slip form paver and fixed aide forms, which are the two most commonly used methods.

8. The standard normal varaite in India is taken as

a) 1

b) 1.65

c) 1.7

d) 1.9

View Answer

Answer: b
Explanation: The standard normal variate is taken as 1.65, for concrete in India, it varies from county to country.

9. The positive tolerance level of sub grade in surface for concrete pavement is

a) 20 mm

b) 25 mm

c) 30 mm

d) 35 mm

View Answer

Answer: a
Explanation: The maximum positive tolerance level for concrete pavement is taken as + 20 mm and negative is – 25 mm.

10. The expansion joints do not consist of

a) Dowel bars

b) Joint filler

c) Joint sealer

d) Tack coat

View Answer

Answer: d
Explanation: An expansion joint consists of dowel, joint filler and joint sealer, tack coat is used in bitumen surfaces.
Low Volume Roads

1. The design life for low volume roads is

a) 10 years

b) 15 years

c) 20 years

d) 30 years

View Answer

Answer: a
Explanation: The low volume roads consist of low volume traffic and its life span is taken as 10 years.

2. The million standard axles in low volume roads is considered as

a) 1 million

b) 1.5 million

c) Less than 1 million

d) 2 million

View Answer

Answer: c
Explanation: The volume on low volume roads is taken less than 1 million for design purpose, it may actually be more but for ease it is taken as 1 million.

3. The low volume roads are designed as

a) All weather roads

b) Fair weather roads

c) Flexible pavement

d) Rigid pavement

View Answer

Answer: b
Explanation: Though the low volume road may have a lesser life span and capacity it should be accessible in all weathers.

4. The type of road used for ESAL value less than 10000 is

a) Earth road

b) Gravel road

c) Flexible pavement

d) Rigid pavement

View Answer

Answer: a
Explanation: The earth road is the most suitable for less volume of road, it is a value that is obtained based on the traffic load.

5. The maximum limit of sub grade thickness is

a) 150 mm

b) 200 mm

c) 300 mm

d) 400 mm

View Answer

Answer: c
Explanation: The prepared sub grade is limited to a maximum of 300 mm, in any case it must not exceed 300 mm.

6. The base course is generally laid in earth road for a thickness of

a) 40 mm

b) 60 mm

c) 80 mm

d) 100 mm

View Answer

Answer: d
Explanation: The base course is laid for a thickness of 100 mm, it may exceed in some cases, in some cases it may be 80 mm and even 40 mm in unimportant roads.

7. The camber depends on

a) Road

b) Heat

c) Wind

d) Rainfall

View Answer

Answer: d
Explanation: The camber is provided to eliminate the rain that may be stored near the surfaces.

8. The plasticity index in soil used for low volume roads should be less than

a) 10

b) 9

c) 7

d) 6

View Answer

Answer: d
Explanation: The plastic limit for the soil should not exceed 6 in any case for the soil that is used in the pavement.

9. The gravel content in surface layer can be a maximum of

a) 60%

b) 70%

c) 80%

d) 90%

View Answer

Answer: c
Explanation: The maximum gravel content in surface layer should be maximum of 80% and the minimum depends on the type of the pavement.

10. The minimum slope provided in a surface of cement concrete pavement is

a) 1%

b) 1.5%

c) 2%

d) 2.5%

View Answer

Answer: d
Explanation: The minimum slope provided is 2%, the maximum may be 2.5%. for a surface of the cement concrete pavement.

Soil Stabilized Roads

1. How many objectives of soil stabilised roads ?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: There are two objective of soil stabilised roads, they are to achieve roads with low cost and upgrading of existing roads.

2. The biggest drawback in India for laying roads is

a) Limited roads

b) Limited resources

c) Limited finance

d) Limited labour

View Answer

Answer: c
Explanation: The biggest problem in the developing countries like India is limited finance, so it takes a lot of time.

3. The stabilisation of roads is not done in

a) Sub grade

b) Base

c) Sub base

d) Surface Layer

View Answer

Answer: d
Explanation: The stabilisation of roads is not done in the surface layer of the pavement, because it is made of bitumen or concrete, so stabilization cannot be done.

4. The subgrade thickness is compacted to

a) 200 mm

b) 300 mm

c) 400 mm

d) 500 mm

View Answer

Answer: d
Explanation: For national highway and important roads the thickness is compacted to 500 mm and for village road it may be lesser.

5. The soil stability is not so good in

a) Black cotton soil

b) Gravel

c) Sand

d) Boulders

View Answer

Answer: a
Explanation: The black cotton soil is useful for agriculture, but not so good for pavement as it swell on absorption of the water and retain them as they are suitable for agriculture, plants grow very well in black cotton soil.

6. The more thickness of the excavation will lead to

a) More stability

b) Less stability

c) Increase of cost

d) Decrease of cost

View Answer

Answer: c
Explanation: The more thickness of the excavation will lead to more labour charge, which lead to more cost.

7. The PMGSY aims to connect

a) Highway

b) Cities

c) Towns

d) Villages

View Answer

Answer: d
Explanation: The PMGSY was launched to connect the villages all across the country from north to south and east to west by linking them with a nearby city.

8. The construction of soil stabilised roads is possible in

a) High volume roads

b) Highway

c) Village road

d) Low volume roads

View Answer

Answer: d
Explanation: The soil stabilised roads can be used in places where the volume of traffic is very low.

9. The black cotton soil is replaced in which roads?

a) Highway

b) Low volume road

c) Street road

d) Village road

View Answer

Answer: a
Explanation: The priority is maximum given to the highway for laying roads, and if soil is not suitable then it is replaced.

10. The most commonly used material for stabilisation of soils is

a) Cement

b) Lime

c) Heating

d) Chemicals

View Answer

Answer: a
Explanation: If there is no chance for soil replacement or its very costly then cement stabilised soil is used.
Mechanical Soil Stabilization

1. The first principle of mechanical soil stabilisation is

a) Proportioning

b) Compaction

c) Consolidation

d) Shear

View Answer

Answer: a
Explanation: The first principle of mechanical stabilised soil is proportioning and then compaction.

2. The non desirable property of soil is

a) Shear

b) Swelling

c) Incompressibility

d) Stability

View Answer

Answer: b
Explanation: Swelling is not such a desirable property in soil because change in volume may cause great loss to soil.

3. The maximum dry density of the soil can be achievement by

a) Compaction

b) Consolidation

c) Removal of voids

d) Removal of rocks

View Answer

Answer: a
Explanation: The best method to achieve maximum dry density is by compaction of soil, as it is the easy, best and fast method.

4. The compaction of granular material is

a) Very easy

b) Easy

c) Difficult

d) Very difficult

View Answer

Answer: d
Explanation: The compaction of granular material is a very difficult task as it needs a lot of effort.

5. If the grains in the aggregate lose contact, they

a) Melt

b) Float

c) Freeze

d) Sieze

View Answer

Answer: b
Explanation: When granular material is separated , then the grains in the soil mostly float and in cold region they freeze.

6. The n in the gradation formula is called

a) Gradation value

b) Gradation index

c) Gradation factor

d) Gradation distribution

View Answer

Answer: The n in gradation formula is called as the gradation index of the soil, which is used to denote the property of a particular soil.

7. The value of maximum gradation index lies between

a) 0.5

b) 0.3

c) 0.2

d) 0.1

View Answer

Answer: a
Explanation: The maximum gradation index is 0.5 it depends on the coarseness of aggregate, for less coarse aggregate it may be 0.1 to 0.2.

8. The mechanical stabilised soil does not depend on

a) Gradation

b) Salts

c) Compaction

d) Consolidation

View Answer

Answer: d
Explanation: The mechanical stabilisation of soil doesn’t depend on consolidation as it is a long process.

9. The proportioning method not in use is

a) Rothfutch

b) Triangular

c) Lab tests

d) CBR method

View Answer

Answer: d
Explanation: The CBR method is a method of designing of flexible pavement, the remaining are proportioning methods.

10. The percentage of chemical added in soil by weight is

a) 1

b) 1.5

c) 0.5

d) 0.2

View Answer

Answer: c
Explanation: The usual volume of chemical added in soil is 0.5% of weight of soil, if it is added more then the soil may lose it’s strength.

Soil Cement Stabilization

1. In soil cement stabilisation the bond is imparted between cement and

a) Water

b) Fine aggregate

c) Coarse aggregate

d) Soil

View Answer

Answer: d
Explanation: In the soil cement stabilisation, the bond is imparted between hydrated cement and compacted soil.

2. Making of solid into fine powder is called.

a) Powdering

b) Crushing

c) Pulverising

d) Refining

View Answer

Answer: c
Explanation: The crushing of the solid into the fine powder is called as pulverising, mostly pulverised materials are used.

3. The chemical that can harm the hydrated cement is.

a) Calcium sulphate

b) Calcium di sulphate

c) Calcium tri sulphate

d) Magnesium sulphate

View Answer

Answer: d
Explanation: The magnesium sulphate is a very strong chemical and it may even effect the hydrated cement reducing its strength.

4. The increase of cement causes.

a) Increase in weight

b) Increase in void ratio

c) Increase in strength

d) Increase in porosity

View Answer

Answer: c
Explanation: The increase in cement causes the increase in strength and durability, and of water is added then it's strength decreases.

5. Presence of unpulverised dry lumps reduce the.

a) Strength

b) Durability

c) Strength and durability

d) Water content

View Answer

Answer: c
Explanation: The strength and durability of the soil are badly affected by the unpulverised powder.

6. If compaction efforts increase, then.

a) Dry density increase

b) Dry density decrease

c) Wet density increase

d) Wet density decrease

View Answer

Answer: a
Explanation: If compaction efforts increase, then dry density increase and wet density doesn't change.

7. The high temperature in soil cement stabilisation accelerates.

a) Strength

b) Dry density

c) Shear

d) Compaction

View Answer

Answer: a
Explanation: The higher temperature leads to rapid drying of the sample, which leads to the gain in strength.

8. The additive not used in soil cement stabilisation is.

a) Sodium hydroxide

b) Sodium carbonate

c) Calcium chloride

d) Sugar

View Answer

Answer: d
Explanation: Sugar is a retarder and it should not be used in soil cement stabilisation, whereas other chemicals like calcium chloride and sodium carbonate can be used.

9. The BIS for soil cement stabilisation is based on.

a) British

b) ASTM

c) PCA

d) British and ASTM

View Answer

Answer: d
Explanation: The BIS method is based on both British and ASTM for the soil cement stabilisation.

10. The soil samples are prepared in a mould of diameter.

a) 5 cm

b) 10 cm

c) 15 cm

d) 20 cm

View Answer

Answer: a
Explanation: The samples are tested in a sample of diameter 5 cm and height 10 cm, by compacting them into the mould.

11. The graph between cement content and compressive strength is plotted for how many days of curing?

a) 3 days

b) 5 days

c) 7 days

d) 9 days

View Answer

Answer: c
Explanation: The graph is plotted for cement content and compressive strength for a curing period of 7 days.

12. The maximum brushing loss for A6 A7 soil type is.

a) 5

b) 6

c) 7

d) 10

View Answer

Answer: c
Explanation: The PCA recommends a loss of not more than 7% for soil type of A6 and A7, after 12 cycles of freeze and thaw.

13. The plasticity index of soil cement base course should be less than.

a) 28

b) 18

c) 38

d) 48

View Answer

Answer: b
Explanation: From practical considerations, the results obtained tell that the plasticity index should be less than 18.

14. How many methods are available for the construction of soil cement base course?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The two available methods are mix in place method, plant mix method.

15. The degree of pulverisation is checked by sieve of.

a) 10 mm

b) 6.25 mm

c) 4.75 mm

d) 2.36 mm

View Answer

Answer: c
Explanation: The degree of pulverisation is checked by the sieve passing through 4.75 mm and it should exceed 50%.

Soil-Lime Stabilization

1. The non desirable property of soil after addition of lime is.

a) High affinity with water

b) Friability

c) Pulverisation

d) Reduction in plasticity

View Answer

Answer: a
Explanation: The soil should show less affinity towards the water, and all other changes are desirable.

2. The maximum dry density of soil lime mix is decreased by.

a) 1 to 1.5%

b) 2 to 2.5%

c) 2 to 3%

d) 4 to 5%

View Answer

Answer: c
Explanation: The maximum dry density decrease by 2 to 3%, but it doesn't effect its strength in any manner.

3. The structure of clay is.

a) Flocculated

b) Dispersed

c) Elongated

d) Flaky

View Answer

Answer: a
Explanation: The structure of clay is formed in flocks and when they react, a flocculated structure is formed.

4. The flocculated substances are.

a) Stable

b) Unstable

c) Neutral

d) Depends on soil

View Answer

Answer: a
Explanation: The flocculated substances are very stable, and they even remain stable under subsequent soaking.

5. The factor on which the property of soil lime doesn't depend is.

a) Soil

b) Lime

c) Shear

d) Curing

View Answer

Answer: c
Explanation: The soil lime doesn't depend on the shear, as it is a property of soil it can't change the stability.

6. The increase in soil strength depends on.

a) Clay fraction

b) Thixotropy

c) Activity

d) Shear

View Answer

Answer: a
Explanation: The clay fraction content in soil affect the physical and other properties such as base exchange and pozzolanic action.

7. The point at which plastic limit increase and then decrease is.

a) Lime point

b) Fixing point

c) Lime fixation point

d) Lime reducing point

View Answer

Answer: c
Explanation: The plastic limit in lime stabilized soils, increase up to a certain point and then decrease, it is termed as lime fixation point.

8. The chemical which causes burns while working with is.

a) Quick lime

b) Hydrated lime

c) Quick cement

d) Sulphate resistant cement

View Answer

Answer: a
Explanation: The quick lime is very effective in stabilisation, but it causes burns, so hydrated lime is preferred.

9. The compaction is carried out at.

a) 6% Water content

b) OMC

c) MDD

d) Saturated density

View Answer

Answer: b
Explanation: The strength is a very important factor considered in the soil lime stabilisation, so it is compacted at OMC to achieve MDD.

10. The strength of soil lime for several years after curing.

a) Increases

b) Decreases

c) Remains constant

d) Can’t say

View Answer

Answer: a
Explanation: The lime soil strength increases with increase in curing period unless and until effected by external sources its strength increases.

11.The substance added with lime for extra strength are called .

a) Fertiliser

b) Additive

c) Plasticiser

d) Super plasticiser

View Answer

Answer: b
Explanation: The strength of lime alone is not enough for the stabilisation, so special substances called additives are added.

12. The design of soil lime mix is based on.

a) BIS

b) PAC

c) ASTM

d) Lime fixation point

View Answer

Answer: d
Explanation: The design of lime soil mix is based on lime fixation point, as it has no specific method for design.

13. The first step in the construction step of soil lime base course is.

a) Preparation of sub grade

b) Preparation of pulverised soil

c) Field tests

d) Pre conditioning

View Answer

Answer: a
Explanation: The first step after design of the mix is preparation of the sub grade followed by pulverising.

14. The lime soil can’t be used in.

a) Sub base

b) Base

c) Surface

d) Sub grade

View Answer

Answer: c
Explanation: The lime soil is very weak and cannot be used in the surface course, it can only be used in light traffic areas.

15. Increase in lime content results in.

a) Decrease in plastic limit

b) Decrease in plasticity index

c) Increase in plasticity index

d) Change in volume

View Answer

Answer: b
Explanation: The increase in lime content will cause a slight change in plastic limit, increasing the plastic limit and decrease of plasticity index.
Stabilization of Soil Using Bituminous Materials

1.The basic principle of bituminous stabilisation is.

a) Water proofing

b) Cohesion

c) Water proofing with cohesion

d) Adhesion

View Answer

Answer: c
Explanation: The principle of the bituminous stabilisation mix is to impart strength by cohesion and water proofing.

2. The most commonly used bitumen is.

a) Tar

b) VG 70

c) Cutbacks

d) VG 30

View Answer

Answer: c
Explanation: The most commonly used bitumen is cutback and emulsion, depending on the requirements.

3. The bituminous layer can be used in which layer of the pavement in low rainfall areas?

a) Sub grade

b) Sub base

c) Base

d) Surface

View Answer

Answer: d
Explanation: The bituminous stabilisation road can be used in the sub base ,base and even surface course if there is low rainfall.

4. The soil not preferred in bituminous mix is.

a) Sand

b) Clay

c) Gravel

d) Granite

View Answer

Answer: b
Explanation: All the soils other than clay are having high permeability, high clay content is not desirable as it expands.

5. The increase in strength in soil may be seen at an age of.

a) 3 days

b) 7 days

c) 28 days

d) 56 days

View Answer

Answer: c
Explanation: The strength of the soil increases up to a certain limit and then decreases, but for clay it will increase if soaked for long period like 28 days.

6.The OMC of bitumen binder is taken as.

a) 2%

b) 3%

c) 5%

d) 8%

View Answer

Answer: c
Explanation: The OMC is usually considered based on the experience, but it may be taken anywhere between 4 and 6%.

7. The stability of the bituminous mix is always.

a) Greater than water content

b) Lesser than water content

c) Equal to water content

d) Can’t determine

View Answer

Answer: a
Explanation: If a graph is drawn between the bitumen content and maximum dry density its stability is always greater than water content.

8. The higher compaction will result in.

a) Less stability

b) Less strength

c) Less absorption of water

d) High absorption of water

View Answer

Answer: c
Explanation: The higher resistance to the absorption of water can be achieved by the higher compaction effort.

9. The liquid limit of soil bitumen mix should be less than.

a) 60%

b) 50%

c) 45%

d) 40%

View Answer

Answer: d
Explanation: The liquid limit of the soil based on practical considerations should be less than 40%, it is even good if it is lesser.

10. The bitumen giving more better results is.

a) Cutback

b) Emulsion

c) VG 30

d) VG 40

View Answer

Answer: a
Explanation: The emulsion gives an inferior result when compared with the cutback, so the cutback is the most preferred bitumen.

Special Problems in Soil Stabilization Work

1. How many types of challenges are encountered in bitumen stabilisation?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The major problems are choice of stabilisation, design mix and thickness of layer.

2. The final choice of stabilisation technique is based on.

a) Labour

b) Material

c) Equipment

d) Cost

View Answer

Answer: d
Explanation: Though all the equipment, labour and materials are equally important, the final factor is cost.

3. The flexural strength is based on.

a) IRC

b) Plate test

c) CBR

d) Shear

View Answer

Answer: c
Explanation: The most commonly used method for testing the strength of the flexible pavement.

4. The mix design should take into consideration.

a) Stability

b) Durability

c) Stability and durability

d) Age

View Answer

Answer: c
Explanation: The mix should take into consideration, the stability and durability requirements, strength is also equally important.

5. The modification factor used in base course thickness is called.

a) Granite equivalence

b) Gravel equivalence

c) Sand equivalence

d) Soil equivalence

View Answer

Answer: b
Explanation: In the thickness of the pavement layer the mix can’t be designed directly, so it needs some factor which is called equivalence factor.

6. The colloidal content in BC soils can be up to.

a) 20%

b) 30%

c) 40%

d) 50%

View Answer

Answer: d
Explanation: The colloidal content in the soil may be up 50%, which is an undesirable property for pavement.

7. The shrinkage limit value in BC soil is

a) 0%

b) 9%

c) 15%

d) 16%

View Answer

Answer: c
Explanation: The BC soils have a less shrinkage limit value from 10% to 15% , which is a very high value, whereas in sand and silt they don’t exist.

8. The cement content required for BC soil is.

a) High

b) Very high

c) Low

d) Very low

View Answer

Answer: b
Explanation: The cement content required for the cement is 15 to 25%, so it is not advisable to directly stabilize with cement.

9. The desert sand is.

a) Strong

b) Weak

c) Normal

d) Unfit for pavements

View Answer

Answer: b
Explanation: The sand in the desert is very huge and non availability of water is a major problem in the desert, and desert sand is very less stable, hence suitable stabilisation should be done.

10. The water content in emulsion is about.

a) 10%

b) 20%

c) 30%

d) 40%

View Answer

Answer: d
Explanation: The emulsion in the mix consists of 40% of water, hence it is used for stabilisation of desert sand.
Importance of Highway Maintainence Works

1. The earth slopes and cuts get damaged due to.

a) Rain cuts

b) Erosion

c) Weathering

d) Unevenness

View Answer

Answer: a
Explanation: The embankment and earth slopes particularly during rainfall get heavily damaged due to the formation of cuts.

2. The erosion between shoulder and pavement leads to.

a) Drop

b) Break down

c) Edge drop

d) Flat drop

View Answer

Answer: c
Explanation: The erosion between the pavement and shoulder leads to the formation of the edge drop.

3. The deterioration rate is more in.

a) Flexible pavements

b) Rigid pavements

c) Composite

d) Same in all

View Answer

Answer: a
Explanation: Usually the deterioration rate of the pavement is more in flexible than rigid because it’s having a less design life.

4. How many types of deterioration can be found in pavements.

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The deterioration of the pavement is of 2 types, structural and functional, structural is related to design and functional is related to the maintenance aspects.

5. Which factor doesn't affect the physical deterioration?

a) Traffic

b) Climate

c) Environment

d) Population

View Answer

Answer: d
Explanation: The population may surround near the pavement, but it is not going to affect the pavement.

6. Which of the following is a physical factor?

a) Formation of pot holes

b) Formation of unevenness

c) Freezing and thawing

d) Formation of ruts

View Answer

Answer: c
Explanation: The freezing and thawing is a physical factor, whereas the remaining all are structural.

7. The road roughness is measured by

a) Bump integrator

b) Laser profile

c) Both bump integrator and laser

d) Overlay vehicle

View Answer

Answer: c
Explanation: The road roughness can be measured by both bump integrator and laser, bump integrator is widely used whereas laser is used in advanced countries.

8. The uniform speed of bump integrator is .

a) 10 Kmph

b) 15 Kmph

c) 25 Kmph

d) 30 Kmph

View Answer

Answer: d
Explanation: The uniform speed of the bump integrator is 30 Kmph, considered to measure the unevenness.

9. The pavement rating of 3 is regarded as.

a) Poor

b) Good

c) Very good

d) Excellent

View Answer

Answer: b
Explanation: The rating of the pavement is considered from 0 to 5, as very poor, poor, good, very good and excellent.

10. The pavement surface value needing immediate attention is.

a) 1.5

b) 2.0

c) 2.5

d) 3.0

View Answer

Answer: c
Explanation: The pavement surface index value needing immediate attention is 2.5, if not taken any immediate action then pavement may fail.

Deterioration and Damages in Road Infrastructure

1. The damage can be caused to a well designed pavement in a hot region is by.

a) Rain

b) Heat

c) Snow

d) Traffic

View Answer

Answer: a
Explanation: The surface may be not exposed to heat always, and there is no snowfall, only rain is a factor that will effect the strength.

2. The blockade of the longitudinal and cross drains leads to.

a) Increase of water

b) Decrease of ground water

c) Stagnation

d) Floods

View Answer

Answer: c
Explanation: The blocking of cross drainage and longitudinal drainage will lead to the stagnation of water.

3. The deterioration left unnoticed will lead to.

a) Increase of cost

b) Increase of life span

c) Increase of initial cost

d) Decrease of material

View Answer

Answer: a
Explanation: The cracks or any defects may lead to the heavy damage if not noticed and cause more repair cost than initial cost.

4. The inadequate compaction of sub grade may lead to distress in.

a) Flexible pavements

b) Rigid pavements

c) Both flexible and rigid

d) WBM roads

View Answer

Answer: c
Explanation: The flexible and rigid pavement are laid on the soil subgrade so they are affected by distress.

5. Which of the following is a cause of distress in rigid pavement only?

a) Inadequate compaction

b) Inadequate drainage

c) Dowel bars

d) Defect in materials

View Answer

Answer: c
Explanation: The dowel bars are the only materials used in the concrete roads and the remaining defects are found in the flexible pavement also.

6. The maintenance operations do not involve.

a) Survey work

b) Assessment of road condition

c) Diagnosis

d) Adopting the most appropriate steps

View Answer

Answer: a
Explanation: The survey work is a factor, which is considered before the construction, the remaining steps are done before the construction.

7. The rate of growth of the deterioration is.

a) Linear

b) Parabolic

c) Exponential

d) Cubical

View Answer

Answer: c
Explanation: The rate of deterioration in the flexible pavement particularly is exponential curve, it doesn't go linearly or parabolically.
advertisement

8. The failure of the pavement which is not dependent on the design is.

a) Inferior materials

b) Delay of compaction

c) Settlement

d) Overloaded vehicles

View Answer

Answer: d
Explanation: The loading of the vehicles can't be estimated and it doesn't depend on the design.

9. The distress in bituminous pavement due to ineffective drainage system develops during.

a) Summer

b) Winter

c) Rainy

d) Spring

View Answer

Answer: c
Explanation: The deterioration rate is more than normal in the rainy season, and it may effect the drainage system.

10. The failure in settlement takes place due to the settlement of.

a) Fill

b) Sub grade

c) Both

d) Embankment

View Answer

Answer: c
Explanation: The deterioration in the settlement may take place due to settlement of fill or sub grade or even both.
Maintenence Requirement in Different Road Components

1. The maintenance works are not possible for.

a) Shoulder

b) Pavement

c) Embankment

d) Sub grade

View Answer

Answer: d
Explanation: The sub grade or soil cannot be maintained as it is covered with other layers of surface.

2. The maintenance of rigid pavement is.

a) Easy

b) Difficult

c) Very difficult

d) Neutral

View Answer

Answer: a
Explanation: The maintenance of the rigid pavement is easy when compared to the flexible pavement.

3. The desired cross slope in embankment is.

a) 1%

b) 2%

c) 3%

d) 4%

View Answer

Answer: d
Explanation: The desired cross slope is 4 to 5%, as it is required to maintain the embankment dry.

4. On roads where the soil has been deposited should be stripped by.

a) Trowel

b) Vicat apparatus

c) Blade grader

d) Bulldozer

View Answer

Answer: c
Explanation: The deposited soil should either be removed by using a blade grader or suitable machinery.

5. The soil erosion may take place on roadside drains where the longitudinal slope is

a) Very steep

b) Steep

c) Normal

d) Not steep

View Answer

Answer: b
Explanation: The erosion of the soil takes place where the longitudinal slope of the drainage is steep.

6. The longitudinal slope erosion can be corrected by.

a) Compaction

b) Consolidated soil

c) Permeability

d) Void ratio

View Answer

Answer: a
Explanation: The longitudinal slope of the erosion of soil may be corrected by using the compacted soil.

7. The culvert is a structure whose span is less than.

a) 15m

b) 60m

c) 7m

d) 6m

View Answer

Answer: d
Explanation: The span of a bridge which is less than 6m is called as a culvert and if up to 15 m as minor bridge and up to 60 m as major bridge.

8. The slopes and edges of road embankment get eroded leading to the formation of.

a) Ruts

b) Cuts

c) Pot holes

d) Cracks

View Answer

Answer: a
Explanation: The slopes and edges of the embankment get eroded usually leading to the formation of ruts.

9. The measure not adopted to take care of the embankment failure is.

a) Benching

b) Grass turf

c) Stone pitching

d) Rise of embankment above HFL

View Answer

Answer: d
Explanation: Rise of embankment is not an adopted measure it is considered in the design, before the construction as it is a requirement not modification.

10. The miscellaneous road factor for maintenance is.

a) Surface of pavement

b) Shoulder

c) Kerbs and median

d) Geometric design

View Answer

Answer: c
Explanation: The kerb, median and other facilities like traffic signals etc.., are considered as miscellaneous factor for maintenance.
Distresses in Flexible Pavements and Maintenance Measures-1

1. The modern day pavement don’t consider loads of

a) HCV

b) LMV

c) Motor cycle

d) Animal drawn vehicles

View Answer

Answer: d
Explanation: The olden days pavement consisted of most predominantly animal drawn vehicles but they are not used so much now.

2. The CBR method in India is followed since

a) 1950

b) 1960

c) 1970

d) 1990

View Answer

Answer: c
Explanation: In India since 1970s the CBR method is followed and in 1990 a additional layer called drainage layer was added.

3. The failure in olden roads were classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The maximum failure of the pavement is classified into three types namely failure from sub grade, failure in pavement layers and total pavement failure.

4. The recoverable type of deformation is called as

a) Elastic deformation

b) Semi elastic deformation

c) Rigid deformation

d) Semi rigid deformation

View Answer

Answer: a
Explanation: The deformation occurred on pavement in which it can recover itself is elastic deformation.

5. The plastic deformation occurs in

a) Gravel

b) Sand

c) Silt

d) Clay

View Answer

Answer: d
Explanation: The plastic deformation mostly occurs in the clayey soil and it is not even partly recoverable.

6. The consolidation deformation is

a) Non recoverable

b) Semi recoverable

c) Completely recoverable

d) Partly recoverable and partly non recoverable

View Answer

Answer: d
Explanation: The plastic deformation in pavements occurs only in a part and that part may be recoverable or non recoverable depnding on the extent of failure.

7. The shear failure occurs in

a) Elastic deformation

b) Consolidated deformation

c) Plastic deformation

d) All of the mentioned

View Answer

Answer: c
Explanation: The shear failure occurs due to the plastic flow which mostly occurs in the plastic deformation.

8. The deformation doesn’t increase with

a) Increase in stress

b) Increase in load

c) Increase in thickness of pavement

d) Increase in compacted soil

View Answer

Answer: d
Explanation: The compacted soil, is a very important factor for the pavement, if it is compacted properly then the pavement will have less settlement.

9. The shear failure of soil sub grade may be attributed to

a) Inadequate stability

b) Excessive stress

c) Both

d) None

View Answer

Answer: c
Explanation: The failure of sub grade in shear may be attributed to inadequate stability and excessive stress application.

10. The main cause of inadequate stability of bitumen mix doesn’t include

a) Improper gradation of aggregate

b) Use of wrong viscosity grade of bitumen

c) Poor quality check

d) More stopping sight distance provided

View Answer

Answer: d
Explanation: The stopping sight distance is not a property of the bitumen mix, it is a geometric design property.

Distresses in Flexible Pavements and Maintenance Measures-2

1. The measure not adopted in re construction of new highway is.

a) Providing effective drainage system

b) Designing as per traffic

c) Use of inferior quality material

d) Use of modern machinery

View Answer

Answer: c
Explanation: The measure not adopted is use of inferior material, superior quality materials should be used.

2. Common types of unsurfaced roads adopted in India are.

a) Gravel roads

b) WBM roads

c) Both gravel and WBM

d) Flexible pavements

View Answer

Answer: c
Explanation: The gravel roads and WBM roads are most commonly used unsurfaced roads and they get damaged very easily.

3. The cross slope required for the correction of shoulder is.

a) 2%

b) 3%

c) 4%

d) 5%

View Answer

Answer: d
Explanation: The cross slope of the shoulder required may be 5%, as they need frequent attention from damage due to rain.

4. The defects like pot holes, corrugation, rutting can be rectified by.

a) Trenching

b) Grading

c) Dragging

d) Chemical treatment

View Answer

Answer: b
Explanation: The grading is an operation which is used to rectify the defects in initial stage, it is carried out in two stages.

5. The re gravelled course is checked at a distance of every.

a) 10 m

b) 20 m

c) 50 m

d) 100 m

View Answer

Answer: d
Explanation: The gravel course is checked for every 100 m interval by using a camber board.

6. The dust palliative not used for reducing dust is.

a) Magnesium chloride

b) Calcium chloride

c) Molasses

d) Fly ash

View Answer

Answer: d
Explanation: The fly ash is a waste product obtained from the thermal power plant and it is a mineral admixture.

7. The WBM mostly get damaged in.

a) Summer

b) Winter

c) Rainy season

d) Spring

View Answer

Answer: c
Explanation: The WBM mostly get damaged in the rainy season particularly due to steel vehicle drawn by animals.

8. The distress not caused in localised form is.

a) Pot hole

b) Isolated crack stress

c) Localised depression

d) Liquefaction

View Answer

Answer: d
Explanation: The Liquefaction is a phenomenon that occurs in sand, particularly during monsoon and heavy floods.

9. An existing flexible pavement that develops extensive cracks is called.

a) Ravelling

b) Alligator cracks

c) Shear

d) Pot hole

View Answer

Answer: b
Explanation: The flexible pavement which gets extensive cracks by inter connection of blocks is called alligator cracking.

10. Shear failure are classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: Shear failure classified into two types, first one takes place in heavy traffic areas and in second type it is limited to bitumen surface only.
Structural Evaluation of Flexible Pavements and Strengthening by Overlay-1

1. The rate of structural deterioration of flexible pavement doesn't depend on.

a) Stability of pavement

b) Magnitude of traffic

c) Growth rate

d) Climatic change

View Answer

Answer: d
Explanation: The structural deterioration doesn't depend on the climate, it is a functional change.

2. The objective of conducting structural evaluation studies doesn't consist of.

a) To measure the present structural condition

b) Determine the drainage system

c) Estimate the residual life

d) Design of overlay

View Answer

Answer: b
Explanation: The objective of conducting structural evaluation doesn't consist of estimate for the drainage system.

3. The existing strength of pavement can be made stronger by .

a) Construction from sub grade

b) Construction from sub base

c) Construction from base

d) Overlay

View Answer

Answer: d
Explanation: The economic solution is to provide overlay for making the pavement stronger, the remaining methods may be used if the pavement is extremely damaged.

4. The repair cost is approximately how many times of the maintenance cost?

a) Three times

b) Four times

c) Five times

d) Six times

View Answer

Answer: d
Explanation: The maintenance cost if neglected for 3 years rises up to 6 times and even uptown 18 times if neglected for 5 years.

5. The structural evaluation studies are usually conducted for every.

a) 1 year

b) 2 years

c) 3 years

d) 4 years

View Answer

Answer: a
Explanation: The structural evaluation studies are conducted for every 1 year to evaluate the pavement strength.

6. The difference between existing pavement and new pavement is.

a) Strength

b) Deficiency

c) Permeability

d) Shear

View Answer

Answer: b
Explanation: The difference between the thickness of the pavement between existing pavement and overlaid pavement is the deficiency.

7. The Stability of flexible pavement structure depend on.

a) Sub grade

b) Degree of compaction

c) Drainage system

d) Water cement ratio

View Answer

Answer: d
Explanation: The stability doesn’t depend directly on water cement ratio but it depends on the design mix and quality of pavement layers.

8. The elastic recovery of deflection is called.

a) Rebound deflection

b) Elastic deflection

c) Rigid deflection

d) Semi rigid deflection

View Answer

Answer: a
Explanation: The elastic recovery of the pavement is considered as a rebound deflection, if it doesn’t recover it is a failure.

9. The benkleman beam method was developed by.

a) IRC

b) ASTM

c) CGRA

d) NHAI

View Answer

Answer: c
Explanation: The benkleman beam method was designed by CGRA and followed in India. NHAI still follow this method for overlay.

10. The structural evaluation can't be evaluated by.

a) Dynaflect

b) Road rater

c) FWD

d) Bump integrator

View Answer

Answer: d
Explanation: Bump integrator is not a pavement evaluation method, it is an instrument used for the measurement of roughness.

Structural Evaluation of Flexible Pavements and Strengthening by Overlay-2

1. The slender beam used in benkleman beam method is.

a) 3.5 m

b) 3.66 m

c) 3.8 m

d) 3.7 m

View Answer

Answer: b
Explanation: The slender beam dimension in length is 3.66 m, which is hinged to a datum frame.

2. The least count of the small needle in benkleman beam test is.

a) 0.5 mm

b) 1.0 mm

c) 1.5 mm

d) 2.0 mm

View Answer

Answer: d
Explanation: The least count for the large needle of dial gauge is 0.01 mm and small gauge is 2.0 mm.

3. The tyre pressure in benkleman beam method should be inflated to (in kg/cm^2).

a) 5.0

b) 5.2

c) 5.4

d) 5.6

View Answer

Answer: d
Explanation: The plates should be inflated to a pressure of 5.6 kg/cm^2, use of tyres with tubes and rib tread is recommended.

4. Wheel load distribution in one side of benkleman beam test is.

a) 1080 kg

b) 2880 kg

c) 4085 kg

d) 8170 kg

View Answer

Answer: c
Explanation: The total load is 8170 kg, and it is taken as 4085 kg on one side, because it is considered as a single axle.

5. The clear space between the two tyres of the dual wheels should be.

a) 20 mm

b) 25 mm

c) 27.5 mm

d) 30 mm

View Answer

Answer: d
Explanation: The spacing is ideally considered between 30 and 40 mm, it is an ideal requirement for two tyres of the dual wheels, it may even be less or more.

6. The pavement whose rut depth is less than 10 mm is classified as.

a) Poor

b) Very poor

c) Fair

d) Good

View Answer

Answer: d
Explanation: The classification for no cracking or rut depth less than 10 mm is good, if it exceeds 10 mm they are fair, poor and very poor depending on the degree of ruts.

7. The test pits are maximum dug at a distance of.

a) 150 m

b) 250 m

c) 300 m

d) 500 m

View Answer

Answer: d
Explanation: The test pits are dug from a distance of 250 to maximum distance of 500 mm.

8. The minimum length of a sub stretch is.

a) 0.5 km

b) 1.0 km

c) 1.5 km

d) 2.0 km

View Answer

Answer: b
Explanation: The minimum length of a sub stretch is taken as 1.0 km, for longer pavement distances.

9. The depth of the hole dug for measuring of temperature is.

a) 45 mm

b) 55 mm

c) 65 mm

d) 75 mm

View Answer

Answer: a
Explanation: The minimum depth of hole is 45 mm and diameter is 10 mm.

10. The quantity of soil collected in benkleman beam method is.

a) 10 g

b) 100 g

c) 1000 g

d) 2000 g

View Answer

Answer: b
Explanation: The minimum quantity of soil collected is 100 g for checking the plasticity index of soil.
Structural Evaluation of Flexible Pavements and Strengthening by Overlay-3

1. The deflection value D is obtained from multiplying the difference of initial and final gauge difference of.

a) 1

b) 2

c) 3

d) 4

View Answer

Answer: b
Explanation: The deflection value D is given by D=2(Do-Df).

2. The difference between initial and final deflection should not exceed ____ mm, for no leg correction value.

a) 0.02

b) 0.025

c) 0.050

d) 0.075

View Answer

Answer: b
Explanation: The difference between the initial and final deflection should not exceed 0.025m or 2.5 division.

3. The statistical analysis of data doesn’t require .

a) Mean deflection

b) Standard deviation

c) Characteristics deflection

d) Settlement

View Answer

Answer: d
Explanation: The statistical analysis of data requires mean deflection, characteristics deflection and standard deviation.

4. The characteristics deflection value is.

a) Dm+s

b) Dm-s

c) Dm-s

d) Dm/s

View Answer

Answer: a
Explanation: The characteristics deflection is given by Dm+s, where Dm is the mean deflection and s is the standard deviation.

5. The sum of 15 deflections is 100, find the mean deflection.

a) 3.33

b) 4.44

c) 6.66

d) 1.5

View Answer

Answer: c
Explanation: The deflection is given by 100/15=6.66, where 100 is the mean deflection and 15 is the number of observations.

6. The deflection correction will be negative if temperature exceeds.

a) 30

b) 32

c) 35

d) 39

View Answer

Answer: c
Explanation: In India the temperature is considered as 35°c for evaluation of pavement, because India is a sub tropical and hot country.

7. The Overlay thickness depends on how many factors?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The overlay thickness depends on two major factors namely stability and CASA.

8. The VDF is assumed as 4.5 for commercial vehicle count of.

a) 1000

b) 1200

c) 1500

d) 2000

View Answer

Answer: c
Explanation: The vehicle damage factor is assumed as 4.5, for commercial vehicle count of more than 1500.

9. The thickness of flexible overlay is given by.

a) hd-he

b) hd+he

c) hd.he

d) hd/he

View Answer

Answer: a
Explanation: The thickness of flexible overlay is given by hd-he,where hd is the thickness of the new design pavement and he is the existing pavement height.

10. The spacing between longitudinal joints may be.

a) 3.0 m

b) 3.2 m

c) 3.5 m

d) 4.0 m

View Answer

Answer: c
Explanation: IRC recommends a value of 3.5 m for pavement, So the spacing is equal to the width of pavement.
Distresses in Rigid Pavements and Maintenance Measures-1

1. The pavement design in olden days was based on.

a) Mix design

b) Proportion of weight

c) Strength

d) Proportion of weight or volume

View Answer

Answer: d
Explanation: The olden days pavement were designed based on the proportion of weight or volume.

2. The thickness of the pavement in olden days was.

a) 60 mm

b) 75 mm

c) 100 mm

d) 200 mm

View Answer

Answer: c
Explanation: The usual thickness of the pavement in olden days were around 100 to 150 mm, due to lack of technology they used such big sizes.

3. The cement production in India increased by the year.

a) 1970

b) 1980

c) 1990

d) 2000

View Answer

Answer: c
Explanation: During the 1990's the cement gained a rapid growth in production, before the 1990 period cement was imported.

4. The common types of failure in the cement slabs don't include.

a) Mud pumping

b) Development of structural cracks

c) Spalling of joints

d) Erosion

View Answer

Answer: d
Explanation: Erosion of the soil takes place only if there is heavy rain and of the soil is not strong enough.

5. The design thickness of the CC slab of important highway with heavy traffic is.

a) 250 mm

b) 125 mm

c) 275 mm

d) 300 mm

View Answer

6. The process of mud or soil being ejected out through the joints and edges of the CC pavements is called.

a) Mud pumping

b) Ravelling

c) Scaling

d) Ejection

View Answer

Answer: a
Explanation: The mud pumping is a process in which the soil is pumped out of the pavement edges.

7. The factor which doesn’t initiate mud is.

a) Weak CC pavement

b) Strong CC pavement

c) Ineffective drainage

d) CC pavement directly over soil

View Answer

Answer: b
Explanation: The mud pumping is initiated mainly due to high deflection, ineffective drainage and cc pavement laid on soil.

8. The diameter of the holes in the mud jacking process is.

a) 10 mm

b) 15 mm

c) 20 mm

d) 30 mm

View Answer

Answer: d
Explanation: The diameter of holes used for cement jacking is around 30 mm to 50 mm, it may be minimum of 30 mm and maximum of 50 mm.

9. If a part of cement mortar gets detached from the surface, exposing the coarse aggregate which results in a rough surface, then it is called.

a) Ravelling

b) Mud pumping

c) Mud jacking

d) Scaling

View Answer

Answer: d
Explanation: The scaling of cement concrete occurs if a part of cement mortar gets peeled off and exposes the coarse aggregate.

10. The factor not related to scaling of the concrete is.

a) Mix deficiency

b) Higher water cement ratio

c) Good quality of aggregate

d) Chemical impurities

View Answer

Answer: c
Explanation: If the aggregate quality is good, then mix design will not have any defects, so good quality of aggregate can help reduce scaling.

11. The ravelling occurs due to.

a) Impact

b) Shear

c) Abrasion

d) Reaction with water

View Answer

Answer: c
Explanation: The ravelling occurs mainly due to the abrasion of the aggregate, particularly when fine shrinkage cracks occur.

12. The CC pavement is considered good quality of the unevenness index in mm/km is less than.

a) 4500

b) 3500

c) 3300

d) 2200

View Answer

Answer: d
Explanation: If the unevenness index calculated by the bump integrator is less than 2200, then the pavement quality is good.

13. The CC pavement should be construed again if ravelling depth is more than.

a) 10 mm

b) 15 mm

c) 20 mm

d) 25 mm

View Answer

Answer: d
Explanation: The CC pavement ravelling depth should not exceed 25 m, if exceeded 25 m then it should be constructed again.

14. The poly sulphide sealant perform well uptown.

a) 5 years

b) 7 years

c) 10 years

d) 15 years

View Answer

Answer: c
Explanation: The poly sulphide sealant can perform well up to 10 years and it may even last more if maintained well.

15. The shrinkage cracks have a length of.

a) 0.1 m

b) 0.2 m

c) 0.4 m

d) 1.0 m

View Answer

Answer: d
Explanation: The shrinkage cracks usually have a length of 0.3 m to 0.6 m and extend to a depth of 20 to 30 mm.

Distresses in Rigid Pavements and Maintenance Measures-2

1. The probable causes for loss of surface texture don’t include.

a) Poor texturing

b) Abrasion

c) Movement of Traffic

d) Use of durable materials

View Answer

Answer: d
Explanation: The loss of surface is not caused due to the durable materials, it is caused due to non durable materials.

2. The surface texture may be calculated by.

a) Abrasion test

b) Impact test

c) British pendulum number

d) Viscosity test

View Answer

Answer: c
Explanation: British pendulum number is a test which is conducted for the testing of the pavement frictional resistance.

3. The depth of groove in skid resistance test is.

a) 0.5 mm

b) 1.0 mm

c) 1.5 mm

d) 2.0 mm

View Answer

Answer: c
Explanation: The depth of the groove in the skid resistance test is 1.5 mm, in which it can handle the apparatus.

4.The structural distress in the CC pavement is not due to.

a) Excessive loading

b) Inadequate thickness

c) Long spacing

d) Erosion

View Answer

Answer: d
Explanation: The erosion is not a structural distress, it is a type of functional distress, structural distress are related to design.

5. The method not used in structural evaluation of CC pavement is.

a) Visual inspection

b) Deflection test

c) Non destructive testing

d) Benkleman test

View Answer

Answer: d
Explanation: Benkleman test is a method used to verify the deflection of flexible pavement and not used in rigid pavement.

6. The methods of crack repairs are classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The methods of crack repairs are crack stitching, partial depth and full depth repairs.

7. The diameter of bars used for insertion in crack stitching method is.

a) 8 mm

b) 10 mm

c) 12 mm

d) 16 mm

View Answer

Answer: d
Explanation: The diameter of the bars used are 16 mm HYSD bars which are bent into U shape and inserted in holes at 600 mm intervals.

8. The partial depth repairs is limited to a slab height of less than.

a) 150 mm

b) 100 mm

c) 90 mm

d) 75 mm

View Answer

Answer: d
Explanation: The partial depth repairs are limited to a height of less than 75 mm, or 1/3rd of the height of slab.

9. In full depth repairs the diameter of the hole is greater than the diameter of dowel bar by.

a) 1 mm

b) 1.5 mm

c) 2.0 mm

d) 2.5 mm

View Answer

Answer: c
Explanation: The diameter of the hole dug is 2 mm more than the diameter of the dowel bar, which is useful for inserting tie bars.

10. The pavement condition factor for good condition is.

a) 0.25

b) 0.35

c) 0.45

d) 1.0

View Answer

Answer: d
Explanation: The factor for the good, sound and slightly cracked pavement is 1.0, if it gives more cracks it decreases from 0.45 to 0.25.

Objects of Highway Drainage System

1. The process of removing and controlling excess surface and sub soil water within roadway is.

a) Highway Engineering

b) Highway maintenance

c) Highway drainage

d) Highway finance

View Answer

Answer: c
Explanation: The removal of excess surface and sub surface soil within roadway or right of way is considered highway drainage.

2. The number of important factors for highway engineer are.

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The important factors that are considered for the highway engineer are design, construction and maintenance.

3. The highway drainage system consists of how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The drainage system is classified as surface drainage system and sub surface drainage system.

4. The surface water is obtained from.

a) Ground water

b) Rainfall

c) Leakage of water from water treatment plants

d) None of the above

View Answer

Answer: b
Explanation: Both surface and sub surface water are obtained from the rainfall, in case of leakage the water is percolated into the ground,the run off is obtained from the remaining water flowing on the ground.

5. The removal and diversion of surface water from the roadway is called.

a) Surface drainage

b) Sub surface drainage

c) Camber

d) Cross slope

View Answer

Answer: a
Explanation: The removal of land from surface and adjoining land is called as surface drainage.

6. The surface drainage doesn't consist of

a) Camber

b) Road side drains

c) Culverts

d) Curves

View Answer

Answer: d
Explanation: As far as possible the surface drainage should be kept as straight as possible, usually curves are not the part of surface drainage if unavoidable then bends may be provided.

7. The seepage flow is present in.

a) Surface drainage

b) Sub surface drainage

c) Camber

d) Cross slope

View Answer

Answer: b
Explanation: The seepage flow is present in the sub surface drainage which is excavated from the soil.

8. The water that cannot be drained of by gravity is called.

a) Pore water

b) Held water

c) Gravitational water

d) Capillary water

View Answer

Answer: c
Explanation: The gravitational force can't send off the water which is present in pores, such water is called as held water.

9. The structure provided on the pavement to remove the storm water is.

a) Drainage

b) Camber

c) Crown

d) Curves

View Answer

Answer: b
Explanation: The camber is a structure provided on the pavement to drain off the storm water, resulting from rain crown is provided above the camber.

10. The highest point provided on the pavement is.

a) Crown

b) Camber

c) Cross slope

d) Drainage

View Answer

Answer: a
Explanation: The highest point provided on the pavement is called crown, which is provided above the camber and it is not used for the same function as camber.

Requirements and Importance of Highway Drainage

1. The highway drainage requirement don't include.

a) Effective drainage

b) Water entering the roadway

c) Sufficient longitudinal slope

d) Erosion free

View Answer

Answer: b
Explanation: The water should not enter the roadway as it will cause severe damage to the pavements.

2. The preferable height of the water table should be.

a) 0.75 m

b) 1.0 m

c) 1.2 m

d) 0.5 m

View Answer

Answer: c
Explanation: The preferred height for the ground water should be 1.2 m below the sub grade.if it is less than 1.2 m it may raise upward.

3. The precautions should be mostly taken for drainage in.

a) Dry areas

b) Semi dry areas

c) Water logged areas

d) Desert areas

View Answer

Answer: c
Explanation: Special precautions need to be taken especially in the areas where there is water logging.

4. The increase in moisture causes the strength to.

a) Increase

b) Decrease

c) Remains same

d) Can’t determine

View Answer

Answer: b
Explanation: An increase in the moisture content will reduce the strength of the soil, so it should be very carefully calculated.

5. The excess water on shoulder in a dry region with a good drainage system causes.

a) Water stagnation

b) Floods

c) Damage to pavement

d) Increase of initial cost

View Answer

Answer: c
Explanation: The damage of pavement is caused due to the excessive amount of water on the pavement shoulders.

6. The sustained contact with water cause failure due to.

a) Swelling

b) Stripping

c) Ravelling

d) Sloping

View Answer

Answer: b
Explanation: The sustained contact with water in flexible pavement causes stripping of bitumen from aggregate.

7. The damage in cold region is caused due to.

a) Heat

b) Rain

c) Frost action

d) All the above

View Answer

Answer: c
Explanation: In cold regions when freezing temperatures are prevalent then there is a considerable damage due to frost action.

8. The path of wheels cause damage in the form of.

a) Undulations

b) Shear

c) Deflection

d) Ruts and corrugation

View Answer

Answer: d
Explanation: The ruts and corrugation are formed due to the heavy vehicles, and they give impressions on the pavement.

9. The swelling and shrinkage is mostly seen in.

a) Sand

b) Gravel

c) Black cotton soil

d) Kankar

View Answer

Answer: c
Explanation: The black cotton soil is a soil in which mostly alternative shrinkage and drying occurs, in construction of pavement the black cotton soil is not preferred.

10. In India for storm sewage and domestic sewage we use.

a) Individual sewers

b) Combined sewers

c) Iron pipes

d) Closed sewers

View Answer

Answer: b
Explanation: In India we mostly use combined sewers and they are mostly open and made with concrete.
Surface Drainage System for Roads

1. How many components are present in the surface drainage system?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The surface drainage system consists of three components they are camber,side drains and cross drains.

2. If the canal and drain at same level then the cross drainage structure is called.

a) Aqueduct

b) Siphon aqueduct

c) Level crossing

d) Aquiclude

View Answer

Answer: c
Explanation: If the canal and the drainage both are at the same level then the drainage structure is called level crossing.

3. The value of camber in earth roads is.

a) 4%

b) 3%

c) 2%

d) 1.7%

View Answer

Answer: d
Explanation: The value of the camber is recommended as 1.7% for the earth roads, for paved it may be up to 4%.

4. The most preferred shape of drainage is.

a) Rectangular

b) Trapezoidal

c) Triangular

d) Circular

View Answer

Answer: b
Explanation: The trapezoidal shape is the most preferred shape of the drainage because of it’s simplicity and ease.

5. The longitudinal drain may be provided if the cross slope is more than.

a) 1.0%

b) 2.0%

c) 3.0%

d) 4.0%

View Answer

Answer: d
Explanation: The longitudinal drain should be provided only if the cross slope exceeds 4.0%, if it doesn’t exceed then it may not be necessary.

6. The rural roads are provided with .

a) RCC drains

b) Trapezoidal drains

c) Kutcha drains

d) No drainage

View Answer

Answer: c
Explanation: The rural roads are mostly provided with the Kutcha drains, because of less population they are given the least importance.

7. The type of the drainage most advisable in cutting is.

a) Longitudinal drainage

b) Side drains

c) Deep drainage

d) No drainage

View Answer

Answer: c
Explanation: The most advisable type of the drainage in the cutting is open deep drainage, because it is the most convenient type in cutting, remaining types can also be used if there is no alternative.

8. The water may be collected in.

a) Catch pits

b) Longitudinal drains

c) Kerb

d) Filter sand

View Answer

Answer: a
Explanation: The water from the rainfall is collected in a typical type of catch pit, and then it is forwarded to the drains.

9. If the span exceeds 6m then the bridge is called.

a) Culvert

b) Minor bridge

c) Major bridge

d) Truss

View Answer

Answer: b
Explanation: If span is less than 6m it is called as a culvert, and if it is between 6 to 15m it’s a minor bridge, and if total span is 60m it’s a major bridge.

10. The relationship between specific yield specific retention and porosity is.

a) Specific yield+specific retention= porosity

b) Specific yield-specific retention= porosity

c) Specific yield/specific retention=porosity

d) Specific yield*specific retention=porosity

View Answer

Answer: a
Explanation: Porosity is the sum of specific yield and specific retention, specific yield is the ratio of volume of draw down to volume of water stored, and specific retention is the amount of water retained.
Hydrologic Analysis

1. The design aspects of surface drainage system are classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The design aspects are classified into hydrological and hydraulic analysis, these two are the important aspects of drainage system.

2. The objective of hydrological analysis is.

a) Estimate maximum quantity of water

b) Design

c) Maintenance

d) Repair of CD structural defects

View Answer

Answer: a
Explanation: The main aim of hydrological analysis is to estimate the maximum quantity of the water reaching the pavement.

3. The portion of water which flows on surface is called.

a) Run off

b) Catchment

c) Percolated water

d) Storm water

View Answer

Answer: a
Explanation: The portion of the water flowing on the surface after percolation into the ground and remaining on surface is called run off.

4. The factors not affecting run off

a) Intensity of soil

b) Type of soil

c) Topography of soil

d) Type of road

View Answer

Answer: d
Explanation: The run off is not afford by type of road, in national highway and state highway there may not be having more run off but they don’t affect the runoff.

5. The number of steps followed for surface drainage system is.

a) One

b) Two

c) Three

d) Four

View Answer

Answer:d
Explanation: The four steps include collection, finding the drainage, determine the run off and to estimate peak quantity.

6. The rational formula is.

a) Q=CiA

b) Q=ki

c) Q=AV

d) Q= CA

View Answer

Answer: a
Explanation: The rational formula is given by Q=CiA where, Q is the run off, C is the run off coefficient and A is the area of the drainage.

7. The value of C is taken as ____ for bitumen pavements.

a) 1

b) 2

c) 0.9

d) 0.95

View Answer

Answer: c
Explanation: The run off coefficient may be taken as 0.9 for bitumen and CC pavements, as in these pavements water is drained off very easily.

8. The minimum velocity required in drainage to maintain flow is.

a) Self cleaning velocity

b) Sewage velocity

c) Gradient velocity

d) Maximum velocity

View Answer

Answer: a
Explanation: The minimum velocity in which the water can flow with out any pressure is called as self cleaning velocity.

9. The area of the drainage is expressed in

a) 10 sq.km

b) 100 sq.km

c) 1000 sq.km

d) 10000 sq.km

View Answer

Answer: c
Explanation: The drainage area is calculated for every 1000 sq.km for the drainage area present in the locality.

10. For a bitumen pavement calculate the discharge in m3/sec if intensity of the rainfall is 40 mm/sec and area of drainage is 100 m^2

a) 360

b) 36

c) 3.6

d) 0.36

View Answer

Answer: c
Explanation: Q=CiA
Q=0.9*40*100
Q=3.6m3/sec.

Hydraulic Design

1. The side drains and partially filled culverts are designed on the basis of

a) Open channel flow

b) Hydrological analysis

c) Pavement geometry

d) Run off

View Answer

Answer: a
Explanation: The partially filled culverts and side drains are designed on the basis of the open channel flow.

2. The continuity equation is given by

a) Q=KiA

b) Q=AV

c) Q=A/V

d) $Q=AV^2$

View Answer

Answer: The continuity equation is given by Q=AV, where A is the area and v is the allowable velocity.

3. The desirable velocity for sand and silt are

a) 0.2m/second

b) 0.5 m/second

c) 0.7 m/second

d) 0.9 m/second

View Answer

Answer: b
Explanation: The desirable velocity for the silt and sand is 0.3 to 0.5 m/second.

4. The discharge in m^3/sec for a surface drainage of 100 m^2 and a velocity of 5 m/second is

a) 5

b) 50

c) 500

d) 0.5

View Answer

Answer: c
Explanation: Q=AV
Q=100*5
Q=500 m^3/sec.

5. The roughness coefficient is assumed in

a) Chezys formula

b) Manning’s formula

c) Heigen poiuselles equation

d) Continuity equation

View Answer

Answer: b
Explanation: The roughness coefficient is a constant for different types of materials, and it is assumed in Manning’s formula.

6. The hydraulic radius is given by

a) A/P

b) P/A

c) PA

d) A+P

View Answer

Answer: a
Explanation: The hydraulic radius is the ratio of wetted area and wetted perimeter.

7. The maximum value of Manning’s coefficient for soil with heavy vegetation is

a) 0.1

b) 0.2

c) 0.3

d) 0.4

View Answer

Answer: a
Explanation: The maximum value of the Manning’s coefficient for the soil with heavy vegetation is 0.1.

8. The total time for inlet flow and flow along the drain is given by

a) T1+T2

b) T1T2

c) T1/T2

d) T1-T2

View Answer

Answer: a
Explanation: The total time duration of the inlet flow and flow of the drainage is the sum of both the times.

9. If the depth of a trapezoidal section is 0.50 m and free board is 0.15 m , then the total depth is

a) 0.35 m

b) 0.65 m

c) 0.50 m

d) 0.15 m

View Answer

Answer: b
Explanation: The total depth is the sum of both the depth and free board provided
d=0.50+0.15
d=0.65m.

10. The time of flow in minutes for a longitudinal drain of 400 m and with a velocity of 0.8 m/sec is

a) 6.33

b) 7.33

c) 8.33

d) 9.33

View Answer

Answer: c
Explanation: The time of flow=L/V
T=400/(0.8*60)
T=8.33 mins.

Sub Surface Drainage

1.In slab culverts RCC slab is placed over abudment of.

a) Masonry

b) Pre stressed

c) Steel

d) Composite

View Answer

Answer: a
Explanation: Generally the RCC slab is placed over abudment made of masonry only, because other materials are costly.

2. The span of RCC slab is limited to.

a) 1 m

b) 1.5 m

c) 2.0 m

d) 3.0 m

View Answer

Answer: d
Explanation: The span of the RCC slab is usually limited to 3 m as it may have maintenance problems.

3. The minimum diameter used in pipe culverts is.

a) 25 cm

b) 35 cm

c) 45 cm

d) 75 cm

View Answer

Answer: d
Explanation: The minimum diameter of the pipe culverts used is 75 cm made of steel or RCC, usually RCC is only used as steel corrodes.

4. The GWT should be at a distance of ___ from ground level.

a) 0.5 m

b) 0.6 m

c) 1.2 m

d) 5.0 m

View Answer

Answer: c
Explanation: The preferred distance from the ground level is 1.2m, however it is not a problem where ground water table is very low.

5. The total interruption to traffic in a year should not exceed.

a) 45 days

b) 40 days

c) 30 days

d) 15 days

View Answer

Answer: d
Explanation: The interruption should be kept as low as possible, if unavoidable then we must provide it for 15 days.

6. The clay seal may be provided if seepage zone is at a depth of less than.

a) 1.2 m

b) 1.0 m

c) 0.9 m

d) 0.6m to 0.9 m

View Answer

Answer: d
Explanation: The clay seal may be construed if the seepage zone is at a depth of less than 0.6 m to 0.9 m.

7. The capillary control can be controlled by how many methods?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The capillary control can be controlled by two methods called granular capillary cut off and impermeable capillary cut off.

8. To fulfill the adequate permeability the D15 of filter/D15 of foundation ratio should be greater than.

a) 5

b) 10

c) 15

d) 20

View Answer

Answer: a
Explanation: For adequate permeability the ratio of the D15 of filter/D15 of foundation should be greater than 5.

9. The D85 point size is given by.

a) Dp

b) 2Dp

c) 3Dp

d) 4Dp

View Answer

Answer: b
Explanation: The D85 point size of the filter is given by the value 2Dp.

10. The loss of water from leaves present on embankment is called.

a) Evaporation

b) Transpiration

c) Sublimation

d) Boiling

View Answer

Answer: b
Explanation: The vegetation is provided on the embankment as they can absorb the water during heavy rain, and the loss is termed as transpiration.

Hill Roads

1. The roads passing through hilly terrain and leading to the villages and towns near hills are called

a) National highway

b) State highway

c) Hill road

d) Village road

View Answer

Answer: c
Explanation: The roads which pass through hilly terrain and leading to the villages on hills are called as hill roads.

2. The problem not faced in hilly regions is

a) Extreme climate

b) Landslide

c) Snow

d) Summer cracks in pavements

View Answer

Answer: d
Explanation: The cracks are not formed in summer here as there is no hot temperature, but cracks may be due to frost.

3. The hill roads in India are not mostly found in

a) North India

b) North east India

c) Western that’s

d) South India

View Answer

Answer: d
Explanation: The hill roads in India are found mostly in North and north east India , south India also has a few hill roads but not as many as north Indian and border roads.

4. The cross slope for a pavement to be plain should be less than

a) 40

b) 35

c) 25

d) 10

View Answer

Answer: d
Explanation: The minimum cross slope should be less than 10, it is better if it is 0.

5. For a terrain to be termed as steep, the cross slope should be greater than

a) 25

b) 35

c) 45

d) 60

View Answer

Answer: d
Explanation: The terrain may be termed as steep if the cross slope exceeds 60.

6. The hill road should be aligned

a) Stable side

b) Unstable side

c) Based on economy

d) Based on population

View Answer

Answer: a
Explanation: A hill road should always be aligned on the stable side of the mountain, if we consider only economy it may be dangerous.

7. A most common feature in hill road is

a) U turn

b) Hair pin bend

c) Speed limit

d) SSD

View Answer

Answer: b
Explanation: The most common feature in the hill road is hair pin bend, it is provided due to zigzag roads.
advertisement

8. The hill roads are classified into how many types?

a) One

b) Two

c) Three

d) Five

View Answer

Answer: d
Explanation: The hill roads also are classified as national highway, state highway, village roads, major district roads and other district roads.

9. The road development in borders is taken care by

a) BRO

b) IRC

c) NHAI

d) DRDO

View Answer

Answer: a
Explanation: BRO is Border Roads Organisation which was set up by Indian government in 1960.

10. The class division for 3 tonne vehicle is named as ____ by Border Roads Organisation

a) National highway

b) Class 9

c) Class 5

d) Class 3

View Answer

Answer: b
Explanation: The class division for a 3 tonne vehicle is named as class 6, whereas for 1 tonne vehicle and jeep it is class 5 and class 3 respectively.

Alignment of Hill Roads – 1

1.In a hill road, the best alignment when the sum of ascent and descent between extreme points is.

a) Maximum

b) Minimum

c) Maximum+minimum

d) Maximum-minimum

View Answer

Answer: b
Explanation: The total sum of the time of ascent and descent is the minimum in a well designed hill road.

2. The length may be provided ___ times from height.

a) 30

b) 40

c) 50

d) 60

View Answer

Answer: c
Explanation: The permissible length may be increased by 50 times by the height for a hill road, it may vary between 30 to 60 depending on the situation.

3. The application that is not useful for hill survey is.

a) Aerial survey

b) Photogrammetry

c) GPS

d) StaadPro

View Answer

Answer: d
Explanation: StaadPro is a software that is used for the calculation of structural design and other structural functions, whereas the remaining three are useful before the construction and StaadPro is useful for pavement design.

4. The total resistance length of a road is .

a) Effective length

b) Effective length after friction

c) Effective length after skid

d) Effective length after all resistance

View Answer

Answer: d
Explanation: Resisting length of a road is given by effective length after taking into account all the resistances including skid, friction and overturning.

5. The total resisting length increases due to.

a) Increase in friction

b) Decrease in friction

c) Increase in pavement thickness

d) Decrease in pavement thickness

View Answer

Answer: a
Explanation: The total resisting length increases with the increase in friction, as it is mostly dependent on the friction, pavement thickness is for smooth travel.

6. The ruling gradient in trace cut is.

a) 1 in 10

b) 1 in 25

c) 1 in 20

d) 1 in 30

View Answer

Answer: c
Explanation: The trace cut is done at a ruling gradient of 1 in 25, and when it’s complete we have a ruling gradient of 1 in 20, 1 in 30 may provide a gradient of 1 in 25.

7. The minimum width of the trace cut provided is.

a) 1.0 m

b) 1.5 m

c) 2.0 m

d) 2.5 m

View Answer

Answer: a
Explanation: The trace cut is a narrow track of width 1.0 m to 1.2 m made along the alignment of hill road to enable inspection, if more width is provided then it may cause obstruction.

8. Degree of stability of hill side slope don’t depend on.

a) Type of rock

b) Dip

c) Ground water

d) Type of pavement

View Answer

Answer: d
Explanation: The stability of the rock depend on the dip, type of rock and ground water table, any type of pavement is effected irrespective of quality.

9. Stratified sedimentary rocks often occur as.

a) Fault

b) Fold

c) Sediments

d) Dip

View Answer

Answer: b
Explanation: Mostly the stratified sedimentary rocks occur as folds and not as faults, sediment is formed after the igneous rocks are converted into sedimentary rocks.

10. The problem which doesn’t cause landslide in the hill road is.

a) Ground water flow

b) Unstable rock

c) Stable rock

d Overlay of relatively weak soil

View Answer

Answer: c
Explanation: The landslides are not caused due to a stable rock, rather they are helpful in preventing them, ground water flow and weak soil effect the landslide very easily.
Alignment of Hill Roads – 2

1. The alignment of hill roads is divided into how many stages?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: c
Explanation: The alignment of hill road is divided into three stages namely reconnaissance, trace cut and detailed survey.

2. The general route for alignment is selected during.

a) Reconnaissance

b) Trace cut

c) Detailed survey

d) Detailed project report

View Answer

Answer: a
Explanation: The general route for the alignment is selected during the reconnaissance survey and after any problem is found it is modified later.

3. The bench marks are fixed during the.

a) Preliminary survey

b) Reconnaissance

c) Detailed survey

d) After detailed project report

View Answer

Answer: c
Explanation: The bench marks are fixed and longitudinal and cross section are obtained during the detailed survey.

4. The strip length to be surveyed on the straight alignment is.

a) 5 m

b) 10 m

c) 15 m

d) 30 m

View Answer

Answer: c
Explanation: The strip length required to be surveyed on the straight paths is 15 m and on curves it is 30 m.

5. The speed limit on the national highway on hill road in Kmph is.

a) 60

b) 50

c) 40

d) 30

View Answer

Answer: b
Explanation: The speed limit on the national highway for hill road is 50 Kmph and on curves it is 30 Kmph, in plain rotary it is 40 Kmph and on plain it is 60 Kmph.

6. The minimum right of way distance in exceptional cases is.

a) 7 m

b) 5 m

c) 3 m

d) 4 m

View Answer

Answer: c
Explanation: The minimum right of way required is 5 m but in exceptional cases it should be 3 m, it is good if it is 7m.

7. The pavement width for a single lane road on a hill is.

a) 3.5 m

b) 3.75 m

c) 7.0 m

d) 7.5 m

View Answer

Answer: d
Explanation: The pavement width required for a single lane pavement is 3.75 m and 7 m for two lanes, on national highway it is 7.5m.

8. The flatter camber may be provided if the road has a longitudinal gradient greater than.

a) 1 in 40

b) 1 in 35

c) 1 in 30

d) 1 in 20

View Answer

Answer: d
Explanation: The flatter camber may be provided if the longitudinal gradient is greater than 1 in 20, if it is 1 in 30 or 1 in 45, then a cross slope may be provided.

9. The camber for the earth roads should be never less than.

a) 4%

b) 3.75%

c) 3.5%

d) 3.0%

View Answer

Answer: d
Explanation: The camber value recommend for the earth roads in hill alignment is 3.0 to 4.0%, so it should be never less than 3.0%.it may vary depending on the type of road like for bitumen it is 4.0%.

10. The stopping sight distance for a speed limit of 50 Kmph is.

a) 30 m

b) 40 m

c) 60 m

d) 120 m

View Answer

Answer: c
Explanation: The stopping sight distance as recommended by IRC is 60 m for a speed of 50 Kmph, for the value of 40,30 the SSD is 40m and 30 m, 120 m is the ISD.

11. The intermediate sight distance for a speed limit of 50 Kmph is.

a) 120 m

b) 60 m

c) 40 m

d) 30 m

View Answer

Answer:
Explanation:The intermediate sight distance is equal to twice the stopping sight distance.

12. The maximum super elevation on snow bound area is

a) 3.0%

b) 5.0%

c) 7.0%

d) 10.0%

View Answer

Answer: c
Explanation: The maximum permissible slope is 10% in hill roads, but in snow area it is 7.0% only.

13. The minimum sufficient straight distance between the transitional ends for reverse curves is

a) 3.0 m

b) 5.0 m

c) 9.0 m

d) 12.0 m

View Answer

Answer: c
Explanation: The minimum distance between the two transitional ends for reverse curves is 9.0 m.

14. The absolute minimum radius of the curve in snow bound area is

a) 60 m

b) 70 m

c) 80 m

d) 90 m

View Answer

Answer: a
Explanation: The minimum absolute radius of the snow bound area as recommended by IRC is 60 m, it may be up to 90 m depending on the area.
Alignment of Hill Roads – 3

1. The extra width on a hill road with 300 m radius is.

a) 0

b) 0.6 m

c) 0.9 m

d) 1.2 m

View Answer

Answer: a
Explanation: There is no requirement of the extra width on a curve of radius 300 m,whereas for radius of 100 to 300 m extra widening may be 0.6 m, 0.9 m and 1.2 m depending on the requirement and terrain.

2. For a speed of 30 Kmph, and radius of 30 m, the length of the transition curve is.

a) 15 m

b) 30 m

c) 45 m

d) 60 m

View Answer

Answer: b
Explanation: IRC recommends that, for a speed of 30 Kmph and radius of 30 m , the length of the transition curve is 30 m, the values change depending on the speed and length of the transition curve.

3. The minimum speed limit design for hair pin bend is.

a) 20 Kmph

b) 30 Kmph

c) 40 Kmph

d) 50 Kmph

View Answer

Answer: a
Explanation: The minimum speed limit in the hair pin bend is 20 Kmph and if it exceeds it there may be a chance of overturning.

4. The super elevation in the circular portion of the curve is.

a) 1 in 5

b) 1 in 7

c) 1 in 10

d) 1 in 20

View Answer

Answer: c
Explanation: The super elevation on the circular portion of the curve is 1 in 10 as suggested by IRC, it may be maximum up to 10%, but 7% is safe.

5. The maximum gradient in the curve is.

a) 1 in 30

b) 1 in 40

c) 1 in 50

d) 1 in 60

View Answer

Answer: b
Explanation: The maximum permissible gradient in the circular curve portion is 1 in 40, in plain region it varies from 1 in 30 to 1 in 60.

6. The approach gradient should not be steeper than __% for 40 m.

a) 5

b) 6

c) 10

d) 20

View Answer

Answer: a
Explanation: The approach gradient should not be steeper than 5% for 40 m as recommended by IRC, it is permissible by a slight change but if they exceed then there is a change required for the geometric design.

7. The minimum carriage way width for MDR is.

a) 6.0 m

b) 6.5 m

c) 7.5 m

d) 8.0 m

View Answer

Answer: c
Explanation: The minimum carriage way width for MDR is 7.5 m and for village road it is 6.5 m, and 7.0 m for 2 lane national highway.

8. The minimum straight length between any two successive hair pin bend should not be less than.

a) 30 m

b) 40 m

c) 60 m

d) 70 m

View Answer

Answer: c
Explanation: The minimum straight length between any two successive hair pin bend is 60 m excluding the circular curve and transition curve.

9. The ruling gradient in steep terrain upto 3 km height in % is

a) 8

b) 6

c) 7

d) 7.5

View Answer

Answer: b
Explanation: The ruling, limiting and exceptional gradient above 3000 m are 6,7 and 8 respectively.

10. The compensated gradient should not be flatter than.

a) 4%

b) 3%

c) 2%

d) 1%

View Answer

Answer: a
Explanation: The maximum permissible gradient is 75/R, but they should not be flatter than 4.0%.

11. The value recommended by IRC for a deviation angle of 0.16 and the design speed of 30 Kmph, the length of the summit curve is.

a) 40 m

b) 75 m

c) 100 m

d) 200 m

View Answer

Answer: c
Explanation: The value of the length of the summit curve is 100 m for a deviation angle of 0.16 and design speed of 30 Kmph, it varies depending on the deviation angle and speed limit.

12. The value of the valley curve when compared with summit curve for the same design speed may be best justified by.

a) Valley curve value is greater

b) Summit curve value is greater

c) Both are equal

d) Depends on the deviation angle

View Answer

Answer: d
Explanation: The value of the valley curve or summit curve may be greater depends upon the deviation angle.

13. The minimum radius of inner curve in hair pin bend is.

a) 10 m

b) 12 m

c) 14 m

d) 16 m

View Answer

Answer: c
Explanation: The minimum radius of the innermost curve for a hair pin bend is 14 m as recommended by IRC, if there is enough space they may be up to 16 m also.

14. The maximum gradient compensation for a pavement of the radius 150 m is.

a) 1%

b) 2%

c) 3%

d) 4%

View Answer

Answer: b
Explanation: The maximum gradient compensation is 75/R, which is 75/150=2%.

15. The right of way width in normal area for a two lane national highway is.

a) 18 m

b) 24 m

c) 36 m

d) 45 m

View Answer

Answer: b
Explanation: The minimum right of way width for a 2 lane national highway is 24 m in normal cases and 18 m in exceptional cases, if illegally occupied then they may be up to 45 m.

Geometrics of Hill Roads

1. The minimum design speed on major district road of hill is.

a) 30 Kmph

b) 40 Kmph

c) 50 Kmph

d) 20 Kmph

View Answer

Answer: a
Explanation: The minimum design speed is 30 Kmph, maximum is 40 and for steep terrain it is 20 and maximum on highway is 50 Kmph.

2. The width of a pavement of 2 lane national highway is.

a) 7.0 m

b) 3.75 m

c) 8.80 m

d) 3.00 m

View Answer

Answer: a
Explanation: The width of a pavement of a two lane national highway is 7.0 m, for single lane it is 3.75 m and including parapet it is 8.8 m.

3. The minimum setback is.

a) 0.4 m

b) 0.2 m

c) 3.0 m

d) 5.0 m

View Answer

Answer: c
Explanation: Desirable setback is 5.0m, whereas minimum is 3.0m, near rocks it may be reduced by 0.4m and 0.2 m in other cases.

4. The camber for high bitumen road is.

a) 1.7

b) 2.0

c) 2.5

d) 3.0

View Answer

Answer: a
Explanation: The camber for high type bitumen is 1.7 to 2.5 and for thin it is 2.0 to 2.5, for gravel it is 2.5 to 3.0%.

5. The SSD value for speed of 20 Kmph is.

a) 20 m

b) 40 m

c) 25 m

d) 50 m

View Answer

Answer: a
Explanation: The SSD value of the vehicle is same as the speed of the vehicle upto 40 Kmph and thereafter it increases slightly.

6. The ISD value of the hill road with a speed of 50 Kmph is.

a) 50m

b) 100m

c) 60m

d) 120m

View Answer

Answer: d
Explanation: The ISD value is twice the value of the SSD, but after 40kmph it increases slightly, so it is considered as 120m.

7. The minimum super elevation is.

a) 7%

b) 10%

c) Camber

d) Longitudinal slope

View Answer

Answer: c
Explanation: The maximum super elevation is 7%, on hills it is 10%, and for drainage it is considered as camber or cross slope.

8. On which road the maximum radius is provided?

a) National highway

b) MDR

c) ODR

d) VR

View Answer

Answer: a
Explanation: National highway and state highway have the same value of 80m, whereas 50,30 and 20 are provided on the MDR, ODR and VR respectively.

9. The maximum gradient compensation for a radius of 150 m is.

a) 1

b) 2

c) 3

d) 4

View Answer

Answer: b
Explanation: Maximum gradient compensation=75/R
=75/150
=2%.

10. The length of valley curve depends on.

a) Speed limit

b) deviation angle

c) Centrifugal acceleration

d) Speed limit and deviation angle

View Answer

Answer: d
Explanation: The length of the valley curve is dependent both on speed limit and deviation angle, for a speed limit of 50 Kmph and deviation angle of 1.0 the length of the curve is 100m, for the speed of 30 Kmph and deviation of 0.08, length is 30m.
Construction of Hill Roads

1. The number of steps involved in the construction of hill roads are.

a) One

b) Two

c) Three

d) Four

View Answer

Answer: d
Explanation: The construction of hill road include trace cut, jungle clearance, earth work excavation and rock cutting.

2. The hard rock is permitted to over hang the road forming a.

a) Half tunnel

b) Full tunnel

c) 3/4 tunnel

d) 1/4 tunnel

View Answer

: a
Explanation: If the rock strata slopes down into the hill side, then the hard rock is permitted to over hang the road forming half a tunnel.

3. Where there is insufficient time for blasting the alternative method is.

a) Cliff gallery

b) Cradles

c) Excavation

d) Both cliff gallery and cradle

View Answer

Answer: d
Explanation: The blasting may not be useful every time, and if there is no sufficient time, then cradles and cliff galleries are alternatives.

4. The most important structure in a hill road is.

a) Retaining wall

b) Pavement

c) Drainage

d) Security force

View Answer

Answer:a
Explanation: The retaining wall is the most important structure in a hill road as it provides adequate stability.

5. The best type of material for retaining wall is.

a) Concrete

b) Brick masonry

c) Stone masonry

d) Composite

View Answer

Answer: c
Explanation: The best type of material for the retaining wall is stone masonry as it permits the drainage to drain off easily.

6. The general minimum width adopted for the retaining wall is.

a) 0.3 m

b) 0.45 m

c) 0.6 m

d) 0.9 m

View Answer

Answer: b
Explanation: The minimum width of the retaining wall adopted is 0.45 m, and as a thumb rule we use 0.5h to obtain the width of the retaining wall, but never less than 0.45 m.

7. The typical retaining wall is less than.

a) 6 m

b) 5 m

c) 4 m

d) 3 m

View Answer

Answer: a
Explanation: The height of a typical retaining wall may be greater than 6 m, but only for special purpose, the height of the retaining wall usually never exceeds 6 m.

8. The width of the retaining wall foundation is taken as.

a) 0.4h+0.3 m

b) 0.3h+0.3 m

c) 0.2h+0.3 m

d) 0.1h+ 0.3 m

View Answer

Answer: a
Explanation: The width of the retaining wall foundation is given by 0.4h+0.3, where h is the height of the retaining wall and 0.3 is the width at top.

9. The foundation bed is provided with a downward slope of __ towards the hill side.

a) 1 in 6

b) 1 in 5

c) 1 in 3

d) 1 in 1

View Answer

Answer: a
Explanation: The foundation bed is provided with a slope of 1 in 6 or 1 in 4 towards the hill side.

10. The thickness of the pitching done by stone masonry to avoid erosion due to water is.

a) 0.1 m

b) 0.3 m

c) 1.0 m

d) 1.5 m

View Answer

Answer: b
Explanation: The embankment slopes are normally protected with a rough stone pitching of about 0.3 m, to avoid erosion due to water flow.

Maintenance Problems on Hill Roads

1.Catch water drains, sloping drain, road side drains, catch pit and culverts are periodically cleared to prevent.

a) Landslide

b) Over flow of water

c) Earthquake

d) Snowfall

View Answer

Answer: b
Explanation: All are drainage structures and they are maintained periodically to prevent overflow of water, landslide may cause earthquake and in hilly regions there me be a snowfall but primary purpose is to prevent overflow of water.

2. The preventive measure adopted in hill road don’t include.

a) Stabilization of soil

b) Grass turf

c) Stone masonry

d) Brick masonry

View Answer

Answer: d
Explanation: Stone masonry is advisable in hill road as, brick masonry is difficult and as brick joints consists of mortar, seepage may be a problem.

3. The problems in snowfall region, of snow is not cleared is overcome by.

a) Hill markers

b) Snow markers

c) Traffic signal

d) Closing the road

View Answer

Answer: b
Explanation: Mostly in peak snowfall region, the road is closed, but if it is extremely necessary then snow markers may be used.

4. The important structure constructed above the road with out impacting the load is called.

a) Gallery

b) Drainage

c) Camber

d) Crown

View Answer

Answer: a
Explanation: The gallery is a special type of structure which is used for the snow to slide without impacting the load, crown is the highest point, camber is used to prevent the drainage.

5. The frequent problem on the hill road is.

a) Earthquake

b) Landslide

c) Soil erosion

d) Seepage

View Answer

Answer: b
Explanation: All the problems are frequent, but landslide occur very frequently and special care should be taken for landslide.

6. The landslide denotes.

a) Downward and upward movement of hill slope material

b) Disintegration of rocks

c) Earthquake on hill

d) Breaking of rock

View Answer

Answer: a
Explanation: The landslides are a problem which is caused due to earthquake and landslide ultimately leading to the disintegration of rocks and they cause upward and downward movement.

7. The landslide doesn’t take place due to.

a) Sliding

b) Falling

c) Flowing

d) Breaking

View Answer

Answer: d
Explanation: The landslides take place only due to sliding, flowing and falling.

8. The failure of landslide is classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: d
Explanation: The landslides are classified as slides, falls, flows and complex slides.

9. The failure due to shear occurs in.

a) Slides

b) Falls

c) Flows

d) Complex slides

View Answer

Answer: a
Explanation: In slides the movement is caused due to shear failure along one or several surfaces, in complex slides the failure occurs from combination of slides and falls or slides and flow.

10. The measure not advisable to prevent landslide is.

a) Soil nailing

b) Geo synthetic fibre

c) Soil stabilization by any method

d) Retaining wall

View Answer

Answer: c
Explanation: The soil stabilization should not be done by any method, it depends on many factors like soil, slope stability and other factors.

Road Side Development and Arboriculture

1. The studies prepared for environmental studies are called.

a) EIA

b) Environmental study

c) Environment assessment

d) Environment conservation

View Answer

Answer: a
Explanation: The EIA denotes the environmental impact assessment, in which the road side development is assessed based on the impact by using environment studies and environmental assessment.

2. The pressing problems on the existing highway are.

a) Encroachment

b) Ribbon development

c) Both encroachment and ribbon development

d) Traffic

View Answer

Answer: c
Explanation: Illegal encroachment and ribbon development are most common particularly in the rural areas, it's very difficult in encroached areas for the development.

3. The number of factors to be considered during the road side development studies are.

a) Three

b) Four

c) Five

d) Six

View Answer

Answer: d
Explanation: The factors include highway factors, highway traffic operation factors, maintenance aspects, road user amenities, road side plantation and general amenities.

4. The cross drainage structure of a highway is considered in which aspect?

a) Highway factors

b) Highway traffic factors

c) Maintenance aspects

d) Road user amenities

View Answer

Answer: a
Explanation: The cross drainage structure is considered in the highway factors which includes the geometry and drainage works, highway traffic and road users are also benefitted by the drainage system.

5. The compensation for loss of land in agricultural areas should be paid.

a) During the planning stage

b) Before construction of highway

c) After completion of the highway

d) Not required

View Answer

Answer: b
Explanation: As farmers have only agricultural land for their living, the compensation should be paid well before the construction of the highway project.

6. The point that should not be considered for a better highway is.

a) Smooth alignment

b) Small right of way

c) Flat slopes

d) Suitable plantation

View Answer

Answer: b
Explanation: The right of way for a national highway should be wide enough and it should be available for further expansion, flat slopes with camber and smooth alignment and trees for plantation are the best alignment.

7. The planting of trees along road side is called.

a) Arboriculture

b) Geometry design

c) Green belt

d) Garden

View Answer

Answer: a
Explanation: The planting of the trees along the road side is called as arboriculture, in few cities like Visakhapatnam, Andhra Pradesh a green belt is maintained and garden is also provided but the planting of trees is called arboriculture.

8. The trees in urban areas are provided for.

a) Beauty and landscape

b) For fruits

c) To provide shade

d) To provide a cool weather

View Answer

Answer: a
Explanation: In urban areas most of the trees can’t provide shade due to the place restriction, but most of them provide beauty, shade can’t be expected till 20 years and fruits are not edible in a polluted zone.

9. The desirable distance for a tree from the carriage way is.

a) 1.0 m

b) 1.5 m

c) 2.0 m

d) 2.5 m

View Answer

Answer: d
Explanation: The minimum desirable distance from the edge of the pavement is 2.5m and 12m from the centre of the pavement.

10. The number of trees required for 1 km of length in nursery are.

a) 100

b) 150

c) 180

d) 270

View Answer

Answer: d
Explanation: The minimum number of the trees required in the new avenue of a nursery for one kilometre length are 270 in new avenue and 150 in old, 100 and 150 in new and old sites respectively.
Highway Costs

1. The improvement in highway leads to the following.

a) Increase in vehicle operation cost

b) Decreased comfort to passenger

c) Reduction in accident rate

d) Difficulty in driving

View Answer

Answer: c
Explanation: The improvement in highway leads to reduction in the vehicle operation cost, saving time, reduction in accident rate and increased comfort of passengers.

2. Several highway are implemented by.

a) Government

b) Private

c) Public private partnership

d) Depends on the requirement

View Answer

Answer: c
Explanation: Most of the highway are constructed by private companies and maintained by government, some may be government, some may be private but most are public private partnership.

3. The improvement benefits of roads don’t include which type?

a) Improvement in city

b) Improvement in a district

c) Improvement in a state

d) Improvement in between two countries

View Answer

Answer: d
Explanation: The improvement may never take place between two countries as it is a concern regarding security, the Improvement takes place in city, district state and country.

4. The benefits due to the road improvement are classified into how many types?

a) One

b) Two

c) Three

d) Four

View Answer

Answer: b
Explanation: The benefits are classified into two types namely tangible and intangible benefits, tangible are which can be measured and intangible are related to social aspects.

5. The social facilities like medical services, educational and recreation facilities are classified as.

a) Tangible benefits

b) Intangible benefits

c) Both

d) None

View Answer

Answer: b
Explanation: All these are related to social aspects as they are not tangible.

6. The cost of the vehicle operation and time for unit distance may be represented by.

a) T=a+b+c

b) T=a+ (b+c)/speed

c) T=a+b

d) T=a

View Answer

Answer: b
Explanation: ‘a’ is the running cost per unit distance, ‘b’ is a fixed hourly cost and ‘c’ is the portion of cost depending on speed.

7. The rate of fuel consumption for every motor cycle will be at.

a) Low speed

b) High speed

c) Optimum speed

d) Zero speed

View Answer

Answer: c
Explanation: The optimum speed is a speed limit in which neither the bike is going fast nor slow, it usually is between 30-45 Kmph for bikes.

8. The unevenness index in terms of international roughness index is given by.

a) UI=IRI

b) UI=IRI/2

c) UI=IRI/3

d) UI=(IRI)1.12

View Answer

Answer: d
Explanation: The UI is the unevenness index and IRI is the international roughness index, UI is in mm/km and IRI is in m/km.

9. As the unevenness index increases there is no substantial increase in.

a) Fuel consumption

b) Wear and rear of tyres

c) Vehicle maintenance cost

d) Increase of speed

View Answer

Answer: d
Explanation: As there is an increase in the unevenness index, there is no substantial increase in speed, instead it decreases.

10. The maximum life span assumed for the highway is.

a) 70 years

b) 80 years

c) 90 years

d) 100 years

View Answer

Answer: d
Explanation: The life span for the right of way is assumed between 75 to 100 years, and the maximum life span assumed is 100, it may also be 70,80 and 90 depending on the pavement design.

Highway Finance

1. The average annual highway cost for a road system may be summed up by.

a) Ca=H+T+M+Cr

b) Ca=H+T+M-Cr

c) Ca=H+T

d) Ca=H

View Answer

Answer: a
Explanation: The average cost of the annual road system is the sum of all costs like average cost of highway administration, operation and maintenance and also the recovery fund.

2. The CRF denotes.

a) Central Road Fund

b) Capital Recovery Fund

c) Capital Recovery Factor

d) Central Research Fund

View Answer

Answer: c
Explanation: The first cost of a capital improvement is converted into equivalent annual cost which is called capital recovery factor.

3. The Vs in average annual capital cost represents.

a) Savage value

b) Salvage value

c) Waste value

d) Usable value

View Answer

Answer: b
Explanation: Salvage is the income available after the structure has almost completed the life span.

4. If the principal is P and rate of interest is i and it has to be paid in n years then, the sum S is given by.

a) P(1+i)

b) P(1-i)

c) P/I

d) $P(1+i)^n$

View Answer

Answer: d
Explanation: The compound interest is calculated for every year and it’s leived on the preceding interest.

5. The first step in economic analysis is.

a) Determine the AADT

b) Estimate growth rate

c) Assessment of traffic route

d) Estimate additional traffic

View Answer

Answer: a
Explanation: The average annual daily traffic is required for the completion of the remaining steps.

6. The method not used in economic analysis is.

a) Annual cost

b) Rate of return

c) Benefit cost ratio

d) Floating car

View Answer

Answer: d
Explanation: The floating car method is a method which is used for the estimation of the traffic, whereas the remaining are methods of analysis of the cost.

7. The savings in annual road user costs, annual savings in accident costs and capital cost of Improvement are

parameters used in .

a) Annual cost method

b) Rate of return method

c) Benefit cost ratio

d) None

View Answer

Answer: b
Explanation: The transport laboratory of London has developed this method in which a rate of return is obtained by these parameters, the remaining methods don’t require these parameters.

8. The ratio of annual benefit from improvement to annual cost of the improvement is called.

a) Benefit

b) Cost

c) Benefit cost ratio

d) Maintenance cost

View Answer

Answer: c
Explanation: The ratio of annual benefit from improvement to annual cost of the improvement is called benefit cost ratio, benefit is the profit, cost is the investment and maintenance cost is after the investment.

9. The national highway act was ammended in.

a) April 1956

b) June 1995

c) July 1956

d) August 1995

View Answer

Answer: b
Explanation: The national highway act 1956, was amended in June 1995, it was actually planned in April 1956.

10. As on April 2009, how many projects have been completed on BOT basis?

a) 5

b) 42

c) 25

d) 9

View Answer

Answer: d
Explanation: As on April 2009, twenty five projects have been sanctioned and nine projects were completed by April 2009 and in other proposals 42 projects were remaining in which 5 are completed.