

TRANSPORTATION ENGINEERING

UNIT 1

SHORT QUESTIONS:

1. Define rails? Enlist the functions and types of rails?
2. Enumerate the components of rails
3. What are the functions of sleepers?
4. What are the various requirements of sleepers?
5. What do you understand by adzing of sleepers?
6. What are the functions of ballast?
7. What do you understand by creep of rails?
8. What are the various types of fixtures and fastenings?
9. Name at least five causes of rail failures.
10. An MG track has a sleeper density of $M + 5$. If the track is laid with rails of 13 meter length, find out the number of sleepers under one rail length.

LONG QUESTIONS:

1. Define Permanent way? What are the various requirements of a permanent way?
2. Describe the cross section of a permanent way with a neat sketch?
3. What are sleepers? What are the advantages and disadvantages of concrete sleepers?
4. Explain briefly the classification of sleepers?
5. What are the different types of ballast and enumerate the requirements of good ballast?
6. Determine the number of sleepers required for the construction of 1800 m of BG track with the sleeper density of $N + 5$.
7. What is creep? Enlist the causes, effects and the steps involved in the adjustment of creep?
8. What is meant by wear of rails? Enumerate the various types of rails wear and enlist the methods by which it can be measured.
9. Describe the rail fastening used in Indian railway system?

10. What are the requirements of an elastic fastening? List down the various elastic types of fastenings being used in Indian Railway system?

OBJECTIVE QUESTIONS:

1. The weight of the rails depends upon,

- (a) Gauge of the tracks
- (b) Speed of the train
- (c) Spacing of sleepers
- (d) All of the above

2. Which of the following can hold the sleepers in its position?

- (a) Ballast
- (b) Fish plates and Bolts
- (c) Rails
- (d) Formation width

3. Which of the following is a type of rail section?

- (a) Double headed rail
- (b) Bull headed rail
- (c) Vignole's rail
- (d) All of the above

4. On which of the following, the pitch and demand of wave depends in wave action,

- (a) Track modulus
- (b) Stiffness of the track
- (c) Stability of formation
- (d) All of the above

5. In what condition, an addition sleeper is provided,

- (a) Low stability of joints

- (b) At curves
 - (c) At transition curves
 - (d) Joints are staggered in curves
6. Best ballast contains stones varying in the size from _____
 7. The rails which are fitted on sleepers and placed on ballast and subgrade is called _____
 8. The axle load of the train is carried by _____
 9. The measurement of the creep is done by _____
 10. The life span of the concrete sleepers is _____

UNIT 2

SHORT QUESTIONS:

1. Define gradient?
2. Discuss the term “grade compensation”.
3. What is the role of compaction on the properties of concrete?
4. Define the term equilibrium cant?
5. Enumerate the objectives of superelevation?
6. Give the permissible values of cant deficiency for various gauges in India.
7. What is meant by degree of curve?
8. List out the different types of crossing?
9. What are the requirements of an ideal crossing?
10. What essential purposes are served by signalling and interlocking?

LONG QUESTIONS:

1. Draw a neat sketch of a track layout and explain the significance of each component of the same.
2. Classify the types of gradients used on railway track.

3. Discuss the flow table test for measurement of workability of concrete?
4. What is cant? How do you determine the cant deficiency?
5. With the help of a neat sketch explain negative superelevation and method for working speeds?
6. Derive an expression for superelevation when a train is negotiating a curve?
7. What are the different methods of designating a curve? Derive a relationship between the degree of a curve and its radius?
8. Explain the requirements and characteristics of a good crossing?
9. Describe the main constituents of a crossing. Draw neat sketches to show a point rail rail and a splice rail.
10. Define rail joints? Explain the types of rail joints.

OBJECTIVE QUESTIONS:

1. Train derailments is mainly due to,
 - (a) Track defects
 - (b) Vehicular defects
 - (c) Operational of defects
 - (d) All of the above
2. Which of the following comes under gradient category,
 - (a) Ruling gradient
 - (b) Momentum gradient
 - (c) Pusher gradient
 - (d) All of the above
3. For points and crossings, maximum size of ballast is,
 - (a) 50 mm
 - (b) 40 mm
 - (c) 30 mm

- (d) 25 mm
4. The length of the platform depends upon,
- (a) Passengers travelling per day
 - (b) Number of trains travelling per day
 - (c) Longest train running on the platform
 - (d) All of the above
5. Advantage of automatic signalling is,
- (a) Increased safety
 - (b) Increase in track capacity
 - (c) Reduction in delays
 - (d) All of the above
6. The equation for representing equilibrium cant is _____
7. The term crossing is also known as _____
8. The maximum slope provided at the ends of the raised platform is _____
9. The warning signal is placed at a distance of _____ below the semaphore signal.
10. The length of platform in Kharagpur is _____

UNIT 3

SHORT QUESTIONS:

1. How do you orient a runway?
2. How do you compute the airport reference temperature?
3. What are the various factors governing the layout of taxiways?
4. Define terminal area?
5. Define apron with a neat diagram?

6. What are the size parameters and write their effects on airport planning?
7. Write the formula of wake velocity for blast consideration?
8. What do you mean by jet blast?
9. List out the different types of airport?
10. What the factors affecting site selection of a runway?

LONG QUESTIONS:

1. Explain the various surveys to be conducted and the data to be collected for airport site selection?
2. Explain in detail the computation of runway length.
3. Discuss about the correction for runway length?
4. Write short notes on wind rose diagram?
5. The length of a runway under standard conditions is 1800 m. The airport is to be provided at an elevation of 110 m above the mean sea level. The airport reference temperature is 22⁰C.
6. What are the factors to be considered in the geometric design of a runway?
7. What are the factors considered in the design of taxiway of an airport?
8. Write a brief note on runway lightening system?
9. Explain the classification of airports with required tabular details?
10. Explain with neat sketches, the various markings on Runways?

OBJECTIVE QUESTIONS:

1. According to I.C.A.O. the recommended length of airport is decided on,
 - (a) Sea level elevation
 - (b) Efficient gradient percentage
 - (c) Standard sea level temperature (15⁰C)
 - (d) All of the above
2. The height of pilot's eye above the runway surface is assumed,
 - (a) 1 m

(b) 3 m

(c) 4 m

(d) 5 m

3. From the end of an instrumental runway, the approach surface rises outwards,

(a) 1 in 20

(b) 1 in 30

(c) 1 in 40

(d) 1 in 50

4. Which of the following are the patterns of runway,

(a) Single

(b) Parallel

(c) Open V

(d) All of the above

5. Which of the following would effect the size of the apron in airport

(a) Gate position

(b) Number of gates

(c) Systems of aircraft parking

(d) All of the above

6. The beaufort scale is used to determine_____

7. The minimum far spacing provided in parallel runways is _____

8. In geometric standards for taxiway, the turning radius is given by _____

9. The place where loading and unloading of aeroplanes takes place is _____

10. STOL indicates _____

UNIT 4

SHORT QUESTIONS:

1. What are the requirements of good port?
2. Give the requirements of a good harbour?
3. How does a natural harbour differ from an artificial harbour?
4. What are the important features that govern the planning of a harbour?
5. Define breakwater?
6. Define Dock. List out the different types of docks.
7. Write a short note on Jetty?
8. List out the functions of a jetty.
9. What are navigational aids?
10. Highlight on the points to be considered for the maintenance of harbours and their navigational aids?

LONG QUESTIONS:

1. What are the different types of ports? Also give layout of the same.
2. Explain in brief about the ports in India?
3. Discuss in detail the factors to be considered while locating a port?
4. Explain the classification of harbours.
5. Write a note on harbour classification based on location.
6. What are the factors to be considered in the planning of harbour and show its components?
7. State the different types of breakwater and explain with a neat sketch?
8. How are dry docks constructed?
9. Write a short note on transit shed?
10. Explain the floating navigational aids and fixed navigational structure.

OBJECTIVE QUESTIONS:

1. Depth of borings for soil investigation, is generally kept below low water level

- (a) 30 m
- (b) 35 m
- (c) 45 m
- (d) 40 m

2. The important component of sea port is,

- (a) Terminal building
- (b) The docks
- (c) The harbours
- (d) All of the above

3. The breakwater is also known as,

- (a) Quay wall
- (b) Bulk head
- (c) Artificial harbour
- (d) Jetty

4. Which of the following are fixed navigation structures

- (a) Beacon lights
- (b) Light house
- (c) Navigation lights on piers
- (d) All of the above

5. The fixed mooring does not require,

- (a) Mooring post
- (b) Bollard
- (c) Anchors
- (d) Capston

6. The navigable length of Ganga canal is _____

7. The rowing boat is moved with the help of _____
8. The length of largest dry dock is _____.
9. The warehouse when used for storing the dutiable articles which are under custom seal are called as _____.
10. The protected area of water where the boats can safely move is known as _____

UNIT 5

SHORT QUESTIONS:

1. Define Intelligent transport system(ITS)?
2. Write the requirements of user services?
3. Write a short note on detector in interlocking?
4. List the various attributes and characteristics considered in the selection of traffic detection devices?
5. What is the need of Automatic Vehicle Location(AVL)?
6. Explain the three systems of AVI transponder technology?
7. Write a short note on ATMs and give some examples where its technology vcan be implemented?
8. What are APTS technologies?
9. Explain the advantages of ITS architecture?
10. What is the need for an ITS architecture?

LONG QUESTIONS:

1. What are the benefits of ITS?
2. Explain in brief about user services.
3. Explain about the various user services involved in Travel and transportation management.
4. Explain the different user services included in the bundles public transportation operations and emergency management?
5. Give a detailed information on the accuracy of detectors.

6. Explain the applications of ITS?
7. What do you mean by advanced traffic management system? Explain its uses in traffic management.
8. What are the various categories involved in APTS technologies? List out the variety of technology choices used in it?
9. Explain in brief about the various categories of APTS technologies?
10. Give the structure of an abstract ITS architecture?

OBJECTIVE QUESTIONS:

1. Which of the following is considered as cornerstone of various ITS services,
 - (a) Accidents
 - (b) Traffic
 - (c) Freeway
 - (d) All of the above
2. In which sensors, laser beams are used for identifying the presence of vehicle,
 - (a) Passive infrared
 - (b) Passive magnetic
 - (c) Active infrared
 - (d) Ultrasonic
3. Which of the following is known as fixed timing systems,
 - (a) First generation signals
 - (b) Second generation signals
 - (c) Third generation signals
 - (d) All of the above
4. Which sample element provide information about the quality of air when reached to critical level for road user,
 - (a) IVRG

(b) ATMS

(c) APTS

(d) CCTV

5. Which of the following are examples of Acyclic system,

(a) PRODYN

(b) UTOPIA

(c) OPAC

(d) All of the above

6. The mechanical device used for the collection of money at toll is _____

7. IVHS means _____

8. The principle used in video-based devices are _____

9. CCTV means _____.

10. The technology which helps in preventing rear end collision is _____