

VISION INSTITUTE OF TECHNOLOGY KANPUR
CIVIL ENGINEERING 3RD YEAR (6TH SEM)

Transportation Engineering-1 (RCE-603)

UNIT-1

Question bank

(LONG QUESTIONS)

1. What is the role of transportation in the development of the country?
2. What are the different modes of transportation? Explain the specific function of them.
3. Briefly discuss the historical development of road construction.
[2016,2018]
4. Difference between early romans road and present day road construction.
[2018]
5. Briefly outline the highway development in India. [2014, 2018]

Or

Explain briefly the role of the Jayakar committee in road development in India.

6. Write short notes on [2018]
 - a) Central road fund
 - b) Indian road congress
 - c) Central road research institute
 - d) National highway Act
 - e) Highway research Board
7. What are the various methods of classifying road?

OR

Briefly outline the classification based on location and function as suggested in the Nagpur Road Plan

8. Briefly outline the main features of various road patterns commonly in use.
[2018]
9. Explain briefly the role of Nagpur road plan in road development in India.
[2014, 2018]
10. How will you determine the length of roads according to Nagpur road plan?
11. Explain the Bombay road plan. [2014, 2015, 2017]
12. How will you determine the length of roads according to second 20 years road plan?
13. Explain the 3rd 20 year road plan with its salient features.
14. How will you determine the length of roads according to LUCKNOW road plan?
15. What is alignment? Explain the factors controlling the alignment of roads.
16. What are the various surveys to be carried out before planning a highway system for a given area? Explain briefly [2018]
17. Explain how to find location and detailed survey of a highway are carried out.

SHORT QUESTIONS

UNIT-1

Transportation Engineering-1

1. Enumerate the various road plans for the development of highway in India.
2. Explain different types of roads in 3rd 20 year road plan. [2016]
3. Write down the disadvantages of transportation system.
4. Write down the various features of roman road.
5. What do you mean by urban road and classify it?
6. What are the objectives of IRC Highway research board.
7. What are the objectives of highway planning.
8. What are the objectives of NHAI.

UNIT-2
Question bank
(LONG QUESTIONS)

- 18.** What do you understand by highway geometric design? Discuss the objective and factors affecting of geometric design.
- 19.** Describe the cross sectional elements of roads considered for design. Draw a neat sketch of cross section of two lanes road with dual carriage way and median in rural area. Also indicate proper dimension of elements each. **[2014]**
- 20.** Explain camber. What are the objects of camber? Discuss the factors on which the amount of camber to be provided depends. Specify the recommendation ranges of camber for different types of pavements surface.
- 21.** Discuss the various types of shapes of camber in road.
- 22.** Enumerate the factors governing the width of carriage way and right of way.
- 23.** Write short notes on shoulder.
- 24.** Explain sight distance. What are the factors on which the stopping sight distance depends?
- 25.** Derive an expression for finding the stopping sight distance at level and at grade.
- 26.** What is overtaking sight distance? State factors on which the overtaking sight distance depends.
- 27.** Derive an expression for calculating the overtaking sight distance on a highway. **[2015,2018]**
- 28.** Write short notes on
 - a) Intermediate sight distance
 - b) Head light sight distance
 - c) PIEV theory
 - d) Overtaking zone

- 29.** Explain the overturning effect and transverse skidding effect in design of horizontal curve for highway.
- 30.** Explain superelevation. Derive an equation for finding the superelevation required if the design coefficient of lateral friction is f .
- 31.** Explain maximum and minimum superelevation. [2015]
- 32.** State the objective of widening of pavement on horizontal curves. Derive an expression for finding the extra widening required on horizontal curve.
- 33.** What are the objects of providing transition curves? Explain its various types.
- 34.** Derive an expression for finding length of transition curve on horizontal alignment of highway.
- 35.** What are gradients ? What are its various types? Specify the values recommended by IRC for plains and hills.
- 36.** What do you understand by vertical curves ? Explain its various types.[2016]
- 37.** Discuss the design criteria of length of summit curve. Also give the expression of calculation of length of summit curve.
- 38.** Describe the design consideration of length of valley curve. Also write down the formulae for determining the length of valley curve.

SHORT QUESTIONS

UNIT-2

Transportation Engineering

9. What is kerb marking and object marking?[2018]
10. What is kerbed stone? [2018]
11. What is camber? What are the different shapes of camber used.[2016, 2017]
12. What is super elevation.[2017]
13. Define SSD and OSD. [2017]
14. Write down the formula for over taking sight distance and explain each term. [2016]
15. Define and classify the gradients. [2017]
16. What do you understand by setback distance?[2018]
17. What are the stages of the engineering survey for highway location? [2016]
18. What is design speed?[2017]

UNIT-3
Question bank
(LONG QUESTIONS)

39. Discuss the various types of traffic characteristics in traffic engineering.
40. Explain traffic volume. What are its objectives? [2014, 2015, 2018]
41. How are the traffic volume data presented in traffic engineering. [2015]
42. Write short notes on [2014, 2018]
- a) Spot speed
 - b) Space mean speed
 - c) Running speed
 - d) Time mean speed
 - e) Average speed
43. Discuss in detail various methods for spot speed study with application. [2014]
44. Explain origin and destination study. What are the various uses of O and D studies? [2016]
45. Explain the term passenger car units. [2014, 2018]
46. Explain briefly the various aspects to be investigated during parking studies. What are the uses of these studies?
47. What are the different causes of traffic accidents? Discuss the objectives of accident studies.
48. Explain various measures that may be taken to prevent accidents.
49. Write short notes on [2014, 2018]
- a) Traffic capacity
 - b) Basic capacity
 - c) Possible capacity
 - d) Practical capacity

e) Traffic density

50. What are the various types of traffic control devices? [2017]
51. Explain the various types of traffic sign and their functions. Also draw basic layout of type of regulatory and informative sign. [2014, 2018]
52. Discuss the various types of traffic signals. [2015]
53. Explain the Webster method of traffic signal design.
54. Discuss the IRC guidelines for the design of traffic signals.
55. Explain various types of intersection and the basic principles involved. [2017]
56. What is traffic rotary? What are its advantages and limitations in particular references to Indian conditions? [2015]
57. Describe the level of service of rural and urban highway. Give its classification.
58. Discuss the highway capacity and its affecting factors.

SHORT QUESTIONS

UNIT-3

Transportation Engineering

19. What are the different regulatory signs? [2016]
20. Write advantages and disadvantages of traffic signals. [2018]
21. Define rotary intersection [2017]

UNIT-4
Question bank
(LONG QUESTIONS)

59. What are the properties of subgrade soil in road construction?
60. What are the properties of good aggregate which are suitable for road construction work?
61. What are the different types of bituminous materials used in road construction?
62. What are the difference between bitumen and tar?
63. List different types of cutbacks. When they are used. Discuss in brief test carried out in cutback bitumen. [2018]
64. Explain the different types of tests of road aggregate.[2016]
65. Describe various tests carried out on bituminous materials.
66. What is pavement? What are the types of pavement?
67. What are the design factors considered in the design of pavements?[2015,2016]
68. What are the desirable properties of bituminous mixes? What are the steps in bituminous mix design.
69. Explain the CBR method of pavement design. How Is this method useful to determine thickness of component layers? **OR** Describe CBR method for the design of flexible pavements. [2015, 2016, 2017, 2018]
70. Write flexible pavement design steps and describe the procedure in brief as per IRC(37-2012).[2016, 2017]
71. Discuss westergaard concept of temperature stresses in concrete pavement and explain warping stress and frictional stresses. What is the effect of combination of stresses? [2017]

- 72.** Explain different types of joints in cement concrete pavement. [2016,2017]
- 73.** Explain IRC method of rigid pavement design. [2015]

SHORT QUESTIONS

UNIT-4

Transportation Engineering

- 22.** What are the different bituminous materials? [2016]
- 23.** List out various tests on road materials. [2016]
- 24.** Explain flash and fire points in bitumen. [2018]
- 25.** Define equivalent single wheel load (ESWL) [2018]
- 26.** What are the design parameters for rigid pavements? [2016]
- 27.** Define temperature stresses in concrete pavement. [2017]
- 28.** Discuss expansion and contraction joints. [2018]

UNIT-5
Question bank
(LONG QUESTIONS)

- 74.** What are the various steps for the preparation of subgrade?
- 75.** Explain water bound macadam. [2017]
- 76.** Discuss the specification of course aggregate and binding materials required in WBM construction. Further explain how the following steps in WBM construction are carried out. [2014,2018]
- a) Spreading of course aggregate
 - b) Application of binding materials
- 77.** What is WMM? Write down its construction process.
- 78.** Write short notes on [2014,2016,2018]
- a) Prime coat
 - b) Tack coat
 - c) Seal coat
 - d) Bituminous premix carpeting
- 79.** What is surface dressing? Write the construction procedure for surface dressing. [2014, 2015, 2017]
- 80.** Explain bituminous macadam and asphaltic concrete. [2014,2015,2017]
- 81.** Write short notes on: [2015, 2018]
- a) Sheet asphalt
 - b) Mastic asphalt
- 82.** Write short notes on dry lean concrete (DLC).
- 83.** Write the construction procedure for cement concrete pavement. [2015,2017]
- 84.** Write short notes on roller compacted concrete roads.

- 85.** List different methods of roads construction. Discuss their advantages and limitations. [2016]

SHORT QUESTIONS

UNIT-5

Transportation Engineering

- 29.** Draw typical cross section of macadam's construction. [2018]
- 30.** Define the term 'macadam'.
- 31.** What do you understand by surface dressing? [2016]
- 32.** Differentiate between prime coat and tack coat. [2017]
- 33.** What is wet mix macadam?