

B.E. / B.Tech. Civil Engineering (Model Curriculum) Semester-V
PCC-CE503 - Transportation Engineering-I

P. Pages : 2

Time : Three Hours



GUG/W/24/13726

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Diagrams and Chemical equation should be given wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Discuss the Nagpur Road Plan & in what way it differs from Bombay Road Plan. 8
- b) What are the significant recommendations of Jayakar Committee Report? Mention how this helped in road development in India. 8

OR

2. a) Explain with neat sketches the various factors controlling alignment of roads. 8
- b) What are various traffic signs? Explain any one in detail. 8
3. a) Derive the expression for Overtaking sight distances with neat sketches. 8
- b) While aligning a highway in a built up area, it was necessary to provide a horizontal circular curve of radius 325 m. Design the following geometric factors. 8
 - i) Superelevation
 - ii) Extra widening of the pavement.
 - iii) Length of transition curve.Data available are:
Design speed = 65 kmph, length of wheel base of largest truck = 6 m,
pavement width = 10.5 m.

OR

4. a) A valley curve is formed by descending gradient of 1 in 40 which meet ascending gradient 1 in 30. $f = 0.35$, reaction time = 2.5 sec. 8
 - i) Find out the length of valley curve for design of 80 kmph.
 - ii) Find out position of lowest point of valley.
- b) An ascending gradient of 1 in 50 meets a descending gradient of 1 in 80, Determine length of summit curve to provide 8
 - a) ISD
 - b) OSD for design speed of 80 kmph (Assume all other data).

5. a) What are the various tests conducted on bitumen? Explain any one in detail with labelled diagram. 8
- b) Explain CBR and the test procedure for laboratory and field test with sketch. 8

OR

6. a) A Subgrade soil has the following characteristics 8
- i) Passing 425 micron = 50%
 - ii) Passing 75 micron = 62%
 - iii) Liquid limit = 49%
 - iv) Plastic limit = 21%
- Find the group index of soil and rate its subgrade.
- b) What are the various tests for judging the suitability of Aggregates? Explain any two tests in detail. 8
7. a) What is economic span? Derive a formula to determine the economic span of bridge. 8
- b) Discuss various points to be considered for site selection of bridge. 8

OR

8. a) How bridge are classified and numbered? 8
- b) Estimate flood discharge from the following data: 8
- i) Catchment area = 23.8 sq.km.
 - ii) Severest rainfall recorded 200 mm in 4 hrs.
 - iii) Length of forest point in catchment from bridge site = 4.75 km.
 - iv) Average slope in catchment = 1 in 80.
 - v) Runoff co-efficient = 0.75
 - vi) Storm distribution co-efficient = 0.84
9. a) What is meant by bridge superstructure. What are various types. Discuss in brief. 8
- b) Write about bearing provided in bridge. Explain all types of bearing with neat sketches and their function. 8

OR

10. a) Distinguish with neat sketches between suspension bridges and cable stayed bridges. What are various factors affecting their choice. 8
- b) Write a note on: 8
- i) Inspection of bridge.
 - ii) Rating of bridge.
