

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

P. Pages : 2

Time : Three Hours



**GUG/S/23/13726**

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) Explain various survey to be carried out for finalizing of an alignment of new road. **8**

**OR**

2. a) Discuss various aspect investigated during parking studies. What are use of these studies. **8**  
b) What are various traffic sign. Explain any one in detail. **8**
3. a) Calculate maximum allowable speed on horizontal curve of radius 300 m if maximum allowable value of lateral coefficient of friction = 0.15 & rate of superelevation = 0.07. **6**  
b) What are object of highway geometric design list the various geometric elements to be considered in highway design. **10**

**OR**

4. a) A valley curve is formed by descending gradient of 1 in 40 which meet ascending gradient of 1 in 30  $f = 0.35$ , reaction time = 2.5 sec **8**  
i) find out length of valley curve for design speed of 80 kmph  
ii) find out position of lowest point of valley.  
b) Derive the expression for overtaking sight distance with neat sketches. **8**
5. a) Explain with neat sketch CBR test with its limitation. Also draw load penetration curve. **8**  
b) Discuss the various test conducted on Tar and bitumen. Explain any one test in detail. **8**

**OR**

6. a) Explain step by step procedure for WBM roads. What is WBM. **8**  
b) Find group index if a subgrade soil has following characteristic **8**  
i) Passing 425 micron = 76%      ii) Passing 75 micron = 65%  
iii) Liquid limit = 49%      iv) Plastic limit = 21%  
Also rate the subgrade.

7. a) Enlist the various load considered for design of highway bridge. Explain any one in detail. **8**
- b) Discuss various points to be considered for site selection of bridge. **8**

**OR**

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

**OR**

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

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