B.E. Civil Engineering (Model Curriculum) Sem-V

PCCCE503 : Transportation Engineering-I

P. Pages : 2 **GUG/W/22/13726**

Time : Three Hours * 2 9 9 6 * 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. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain in detail, First 20 year Road development plan and its salient features. **6**

b) Explain the necessity and objectives of highway planning. **5**

c) Explain the planning survey to be carried out to finalized the Road alignment. **5**

OR

2. a) Discuss the traffic volume study in detail. Comment on "30^{th} highest hourly volume of traffic". **5**

b) Discuss 'spot speed studies' in detail. Explain how the data is represented. **5**

c) Write note on: **6**
i) 3 E's of Traffic Engineering
ii) PIEV Theory.

3. a) Design the rate of super elevation for a horizontal highway curve of radius 500m and speed 100kmph. **6**

b) Calculate the extra widening required for a pavement of within 7m on a horizontal curve of radius 250m if the longest wheel base of vehicle expected on the road is 7m. Design speed is 70 kmph. **5**

c) Define Camber. Describe its types with suitable sketches. **5**

OR

4. a) For an arterial road in an urban area, the design speed is kept as 100kmph. Design the following road geometric elements: i) Stopping sight Distance & Night S.D.
ii) Superelevation on horizontal curve. Take reaction time as 2.5 sec. and radius of curve as 300m. Assume other data suitably. **6**

b) Calculate extra widening required for a national highway having carriageway width 10.5m. The other data is given below: i) Radius of curve = 280 m ii) Length of wheel base = 6.1m. iii) Speed of vehicle = 100 kmph. **6**

c) Discuss the analysis of overtaking sight distance. Comment on overtaking zones. **4**

5.	a)	Write a short notes on Geosynthetics.	**4**
	b)	Explain the softening point test on bit men with labelled diagram.	**5**
	c)	A subgrade soil has the following characteristics 7 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 its rating as a subgrade.	**7**

OR

6.	a)	What are the various tests for judging the suitability of aggregates? Discuss any two tests in detail.	**5**
	b)	Enlist various test on bitumen? Explain any two with neat sketch.	**5**
	c)	Discuss the engineering survey to be undertaken for the new road proposal.	**6**
7.	a)	Enlist the various forces, Loads and stresses which are to be considered in the design of a bridge Explain any three in detail.	**6**
	b)	What is economic span? Derive a formula to determine the economic span for Bridge.	**6**
	c)	What are the points to be considered while selecting site for a new bridge.	**4**

OR

8.	a)	Initial depth of foundation for a bridge pier is 3.96m. What would be final depth of foundation of a same bridge pier after calculation scouring under the pier for the following condition 300 m^3/sec. ii) Silt factor – 1.1. iii) Bridge having 3 spans of 30m each.	**6**
	b)	What is Afflux? How is it calculated? Comment on the significance of the calculation of afflux value.	**5**
	c)	Explain IRC loading for class AA.	**5**
9.	a)	Discuss the purpose and types of Bearings provided in a bridge.	**5**
	b)	Discuss the inspection & repairs of bridges.	**5**
	c)	Draw the neat sketch of a typical bridge superstructure and enumerate the factors that affects the selection of superstructure.	**6**

OR

10. Write detailed note on **any four.** **16**

i) Cofferdams.

ii) Rating of bridges.

iii) Culverts.

iv) Inspection of bridges.

v) Launching of bridge girders.

vi) Bridge piers.

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