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Name.....

Reg. No.....

FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION OCTOBER 2011

CE/PTCE 09 501—TRANSPORTATION ENGINEERING—I

(2009 Admissions)

Time : Three Hours Maximum : 70 Marks

Assume suitable data wherever necessary.

Part A

Answer all questions.

1. Define grade compensation ? What is the IRC specification ?
2. Draw the typical cross section of urban road in embankment and mark the various features.
3. What are the salient features of Nagpur plan ?
4. List down the describe properties of road aggregates.
5. List down the aircraft characteristics that influence planning of airports.

(5 × 2 = 10 marks)

Part B

Answer any four questions.

1. Explain how the length of transition curve is fixed.
2. A valley curve is formed by a descending gradient of 1 in 40 meeting with an ascending gradient of 1 in 30. Design the length of valley curve for a design speed of 100 kph so as to fulfil both comfort conditions and head light sight distance requirements.
3. Explain the various road user characteristics to be considered in road design.
4. What are the principles of design of at grade intersection ?
5. Bring out the difference between flexible pavements and rigid pavements.
6. Explain minimum turning Radius of aircraft.

(4 × 5 = 20 marks)

Part C

Answer all questions.

1. (a) Define super elevation. What are the objectives of providing super elevations on horizontal curves.

(5 marks)

Turn over

(b) The speed of overtaking and overtaken vehicles are 80 Kph and 60 Kph respectively. If the acceleration of the overtaking vehicle is 2.5 Kph per second, calculate the safe passing sight distance for :

(i) One way traffic.

(ii) two way traffic.

(5 marks)

Or

2 (a) What are the factors which influence the alignments of roads. (5 marks)

(b) A two lane road on rolling terrain has a horizontal curve of radius 200m. If the design speed is 100 Kph, design the Super elevation and extra widening required on the pavement.

(5 marks)

3 (a) What are the various types of spot speed studies ? (5 marks)

(b) Explain the 3 Es of road safety. (5 marks)

Or

4 (a) Explain the various types of traffic signs with sketches. (5 marks)

(b) What do you understand by ITS ? Explain the various features of it. (5 marks)

5 (a) Explain CBR method of flexible pavement design. (5 marks)

(b) Explain the principles of economic evaluation. (5 marks)

Or

6 (a) Compare the various methods of economic analysis. Which among these is widely used by highway engineers.

(5 marks)

(b) List down the various flexible pavement failures. Explain the reasons behind each case.

(5 marks)

7. What are the factors affecting the Choice of site for an airport. (10 marks)

Or

8. The length of a runway under standard condition is 1500 m. The airport site has an elevation of 900 m and reference temperature is 20°C. If the proposed runway permits an effective gradient of 0.2 percent, determine the actual runway length.

(10 marks)

[4 × 10 = 40 marks]