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Total Number of Pages: 01

B.Tech.
PCCI4302

5th Semester Back Examination 2017-18
Transportation Engineering - I

BRANCH: CIVIL

Time: 3 Hours

Max Marks: 70

Q.CODE: B218

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

- a) What is *grade compensation*? (2)
- b) What are the disadvantages of attainment of superelevation by elimination of crown of the camber section? (2)
- c) What are the disadvantages which occur due to improper alignment of highways? (2)
- d) What do you mean by *traffic capacity*? (2)
- e) What is vehicle damage factor and lane distribution factor? (2)
- f) As per the IRC, what are the values of ruling gradient on plain, rolling, mountainous and steep terrain? (2)
- g) What is time mean speed and space mean speed? (2)
- h) Differentiate between *bitumen* and *tar*. (2)
- i) Define CBR. What is the minimum CBR value of subgrade as per IRC: 37-2012? (2)
- j) State the various grades of bitumen? (2)
- Q2** a) Briefly explain the engineering surveys required for locating a new highway. (5)
- b) Briefly explain the salient features of Nagpur Road Plan. (5)
- Q3** a) Design the length of transition curve for a two lane two-way NH having design speed 70 Km/h and radius of circular curve is 235m. Allowable rate of introduction of superelevation is 1 in 150. Pavement is rotated about inner edge. (6)
- b) What are the different factors which affect the highway capacity? (4)
- Q4** a) A valley curve is formed by a descending grade of 1 in 25 meeting an ascending grade of 1 in 35. Design the length of valley curve for a design speed of 65 km/h. The average height of the head light is 0.8m and beam angle is 2°. (5)
- b) Briefly explain the floating car method for speed and delay study. (5)
- Q5** a) Calculate the safe overtaking sight distance for a two-way two lane SH having design speed of 65 km/h, acceleration of overtaking vehicle is 0.99 m/sec². Assume any other suitable data. (5)
- b) Briefly explain the impact test of aggregates used for roads. (5)
- Q6** a) Explain how climatic variation affects pavement design and performance. (5)
- b) Explain the critical locations of loading as regards to wheel load stress in cement concrete pavement. (5)
- Q7** a) Explain the various types of failures in rigid pavement and their causes. (5)
- b) Explain how the problem of road construction in water logged area may be solved (5)
- Q8 Write short note on the following (any TWO): (2x5)**
- a) PCU (2)
- b) Central road fund (2)
- c) Pavement unevenness (2)
- d) Water Bound Macadam (2)