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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*?
 - b) What are the disadvantages of attainment of superelevation by elimination of crown of the camber section?
 - c) What are the disadvantages which occur due to improper alignment of highways?
 - d) What do you mean by *traffic capacity*?
 - e) What is vehicle damage factor and lane distribution factor?
 - f) As per the IRC, what are the values of ruling gradient on plain, rolling, mountainous and steep terrain?
 - g) What is time mean speed and space mean speed?
 - h) Differentiate between *bitumen* and *tar*.
 - i) Define CBR. What is the minimum CBR value of subgrade as per IRC: 37-2012?
 - j) State the various grades of bitumen?
- 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
 - b) Central road fund
 - c) Pavement unevenness
 - d) Water Bound Macadam