USN

Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Transportation Engineering – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting
at least TWO questions from each part.*

PART – A

1 a. Explain the importance of transportation engineering in the development of country? Indicate the advantages and disadvantages of road transport.   **(10 Marks)**
   b. What is the meaning of road patterns? Explain why they are required? With a neat sketch explain the concept of rectangular pattern. What are its disadvantages?   **(10 Marks)**

2 a. Explain the various details that are collected in engineering surveys.   **(10 Marks)**
   b. What is the meaning of realignment of highways? Why it is required? Explain with relevant sketches the circumstances under which realignment is required.   **(10 Marks)**

3 a. What is Right of Way? Why it is required? Explain the various factors on which the Right of Way depends.   **(10 Marks)**
   b. The speeds of overtaking and overtaken vehicles are 90 and 75 kmph respectively of the acceleration of overtaking vehicle is 3 kmph/sec, calculate the OSD required and also calculate the length of overtaking zone required.   **(10 Marks)**

4 a. With a neat sketch, explain the meaning of extra widening. What are the reasons for providing extra widening? Explain with sketches how extra widening is provided by two different methods.   **(10 Marks)**
   b. A valley curve is formed by a descending grade of 1/30 and an ascending gradient of 1/25. Design the length of valley curve for both comfort and head light sight distance for a design speed of 80 kmph. Also final the lowest point on the valley curve and indicate with a neat sketch. Assume the rate of change of centrifugal acceleration as 0.6 m/sec³.   **(10 Marks)**

PART – B

5 a. Define modulus of subgrade reaction. Explain with a neat sketch how it is determined in the field.   **(10 Marks)**
   b. List and explain the various desirable properties of road aggregates. Indicate one test for determining each property.   **(10 Marks)**

6 a. Explain the meaning of ESWL. How it is useful in pavement design? How it is determined graphically?   **(10 Marks)**
   b. Using the data given below, find the stresses at corner, edge and centre of the slab. Also find the location of cracking point from the corner point.
   P = 5100 kg, E = 3 × 10⁵ kg/cm², h = 18 cm, μ = 0.5, K = 6 kg/cm³, a = 15 cm   **(10 Marks)**

7 a. Explain in detail the preparation procedure of clayey subgrade for road construction.
                                                                                       (10 Marks)
   b. Explain the significance of highway drainage and what are the requirements of highway drainage system?   **(10 Marks)**

8 a. Write notes on methods of economic analysis by B/C ratio and annual cost method. **(10 Marks)**
   b. Explain the following terminologies:
      i)   Sources of revenue for governments
      ii) Public Private Partnership in projects
      iii) BOT BOOT concept of financing   **(10 Marks)**

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