



10CV56

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 find the lowest point on the valley curve and indicate with a neat sketch. Assume the rate of change of centrifugal acceleration as  $0.6 \text{ m/sec}^3$ . (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.  
 $P = 5100 \text{ kg}$ ,  $E = 3 \times 10^5 \text{ kg/cm}^2$ ,  $h = 18 \text{ cm}$ ,  $\mu = 0.5$ ,  $K = 6 \text{ kg/cm}^3$ ,  $a = 15 \text{ cm}$  (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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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.