320759(20)

**B. E. (Seventh Semester) Examination,
April-May 2020**

(Old Scheme)

(Civil Engg. Branch)

ADVANCED TRANSPORTATION ENGINEERING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each question is compulsory. Attempt any two part of (b), (c) and (d).*

Unit-I

1. (a) Define highway economics.   2

   (b) What do you understand by 'Annual Highway Cost'. Describe briefly the annual cost method of making highway economics study.   7

   (c) Write short notes on :   7

   (i)   Benefit cost Ratio

   (ii)   Central Road Fund

   (d) It is proposed to float a loan of Rs. 2×10^6 at 5% simple interest for the cost of the bridge. The maintenance charges including the cost of administration of toll is Rs. 30,000/- per year. The capital cost is to be recovered in a period of 50 years. What rate of toll per tonne of traffic should be levied if traffic is 4000 tonne a day for 300 days during the years.   7

Unit-II

2. (a) Define group index.   2

   (b) Explain briefly the modified husband field method of bituminous mix design.   7

   (c) What are the various steps involved in the construction of Water Bound Macadam Road.   7

   (d) What are the different typical rigid pavement failure.   7

Unit-III

3. (a) Define flexible pavement. 2

   (b) What are the various design factors considered in the thickness determination. Describe it. 7

   (c) What are the design methods the flexible pavements. Describe the CBR method in details. 7

   (d) Calculate the thickness of an airport flexible pavement for an equivalent single wheel load of 40 kN. The subgrade has a CBR of 5. The tyre pressure is 1.4 kN/m^2. 7

Unit-IV

4. (a) Describe the general consideration of rigid pavement. 2

   (b) Discuss Westergaard's concept of temperature stress in concrete pavement. 7

   (c) Explain the design of joints in cement concrete pavement. 7

   (d) Determine the spacing between contraction joints for 3·5 m slab width having thickness of 20 cm and f = 1·5 for the following two cases : 7

   (i) for main cement concrete allowable sc = 0·8 kg/cm^2.

   (ii) for reinforcement cement concrete 1·0 cm dia, Bars at 0·30 m spacing.

Unit-V

5. (a) What is soil stabilization technique. 2

   (b) Discuss the slope of soft aggregate in soil stabilization. Explain Mehra's method of stabilization. 7

   (c) Explain the mechanism of soil stabilization. 7

   (d) Discuss the problems in stabilization of : 7

   (i) Black cotton soil

   (ii) Desert sands.