

**B.Tech. Civil (Construction Management)/
B.Tech. Civil (Water Resources Engineering)**

Term-End Examination

00703

June, 2018

**ET-505 : TRANSPORTATION AND TRAFFIC
ENGINEERING**

Time : 3 hours

Maximum Marks : 70

Note : Attempt all questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. Answer any *two* of the following : 2×5=10

- (a) What are the advantages of Containerisation ? What is RO-RO, Piggyback system and Roadrailer ?
- (b) An expressway is to be constructed by a private financier who raises a capital of ₹ 100 crores in the open market. The interest rate is 15 percent. What should be the yearly collection of toll of equal amount so that he is able to wipe off the loan at the end of 10 years ?
- (c) Draw sketches of Telford's cross-section of road and Macadam's cross-section of road. How are cambers provided here ? Explain.

2. Answer any *two* of the following : 2×5=10
- (a) What is PIEV ? What is reaction time ? State its values for a simple situation and a complex situation.
 - (b) Discuss three elements of road-shoulder, median and kerb.
 - (c) What are the principles of design of intersection ? What are the common forms of 'at-grade' intersections and 'grade-separated' intersections ?
3. Answer any *two* of the following : 2×5=10
- (a) Explain surface drainage.
 - (b) Define scope of highway maintenance.
 - (c) An axle load of 130 kN is transmitted to a pavement through a tyre which is inflated to a pressure of 0.7 MN/m^2 . Assuming Boussinesq's conditions to hold and $E = 20 \text{ MN/m}^2$, calculate the deflection at the pavement surface. (Assume $\mu = 0.4$)
4. Answer any *two* of the following : 2×5=10
- (a) Discuss different types of traffic signs.
 - (b) Explain intermediate public transport, light rail transit and mass rapid transit systems of transportation.
 - (c) Write briefly on the three 'E's of road safety.

5. Answer any *two* of the following :

2×5=10

- (a) Define ballast and state its functions. What are the requirements of good ballast materials ?
- (b) A 13 m rail is laid at 30° C and expected maximum rise of temperature is 70° C. Find the expansion gap to be provided while laying the track. (Coefficient of expansion of rail steel : 0.0001152 per °C.)
- (c) What are the considerations to be made for selection of site for railway stations ? State the facilities to be provided at a railway station.

6. Answer any *two* of the following :

2×5=10

- (a) What are advantages and disadvantages of Air Transport ?
- (b) 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 MN/m².
- (c) What is continuous flow system ? What are advantages of pipeline transport ?

7. Write short notes on any **four** of the following :

$$4 \times 2 \frac{1}{2} = 10$$

- (a) Breakwater and Free-port zone
 - (b) Bi-cable ropeways
 - (c) Atterberg's limits
 - (d) Permanent way
 - (e) CBR
 - (f) Stopping sight distance
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