

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

**Term-End Examination
December, 2015**

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

Time : 3 hours

Maximum Marks : 70

Note : Attempt all questions. All questions carry equal marks.

1. Answer any *two* of the following questions : $2 \times 5 = 10$

- (a) What are the four basic components of a transportation system ? Describe briefly each of them.
- (b) By investing ₹ 80 crores in a road improvement project, the saving in vehicles' operation cost can be made as ₹ 12 crores. Is the investment worthwhile, at 16 percent interest rate, when the analysis period is 15 years ? (Apply Benefit/Cost ratio method)
- (c) What general controls need to be considered while selecting the vertical alignment of roads ?

2. Answer any *two* of the following questions : $2 \times 5 = 10$
- Bring out the differences amongst Lane, Width, Carriageway width and Right of way with sketches.
 - Write briefly on Transition curves.
 - Calculate the ruling radius for National Highways in plain terrain.
3. Answer any *two* of the following questions : $2 \times 5 = 10$
- Why is it necessary to compact soil for road construction ? Draw a typical Moisture – Density curve for soils and explain its behaviour.
 - What are the general requirements of good concrete for road pavement ?
 - For selection of road design standard, initial cost is not a good criterion, rather life cycle cost is a better yardstick. Explain.
4. Answer any *two* of the following questions : $2 \times 5 = 10$
- Describe briefly about the Human factors governing road use behaviour.
 - A car, travelling at a speed of 90 km/hour, is brought to a halt by switching off the engine (no brakes being applied). Calculate the distance travelled by the car with the following data :
 - The mass of the car = 1350 kg
 - Coefficient of rolling resistance = 0.02
 - Coefficient of air resistance = 0.40 kg/m^3
 - Frontal area of the car = 2.1 m^2

- (c) What are the methods employed for determining the spot speed of vehicles ? Explain any one of them.

5. Answer any *two* of the following questions : $2 \times 5 = 10$

- (a) What are the elements of Geometric Design of a railway line ? Explain 'Superelevation' with a sketch.
- (b) Draw a list of the advantages and disadvantages of cast-iron sleepers used in rails.
- (c) Write briefly on semaphore type of signals with sketches.

6. Answer any *two* of the following questions : $2 \times 5 = 10$

- (a) What are the factors that affect the site and capacity of an airport ?
- (b) Explain the following :
- (i) Offshore Mooring
 - (ii) Wharf
 - (iii) Quay
 - (iv) Jetty
- (c) What are the components of a belt conveyor system ? Describe briefly each of them.

7. Write short notes on any **four** of the following : $4 \times 2 \frac{1}{2} = 10$

- (a) Warehouse
 - (b) DTM
 - (c) Road Markings
 - (d) One-way Streets
 - (e) Flexible Pavement
 - (f) Concrete Mix Design
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