

Total No. of Questions – [06]

Total No. of Printed Pages: 02

G.R. No.	
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**DECEMBER 2021 - ENDSEM EXAM**  
**FINAL. YEAR B. TECH. (CIVIL) (SEMESTER - I)**  
**COURSE NAME: ADVANCED TRANSPORTATION ENGINEERING**  
**COURSE CODE: CVUA40181B**  
**(PATTERN 2018)**

Time: [1 Hour]

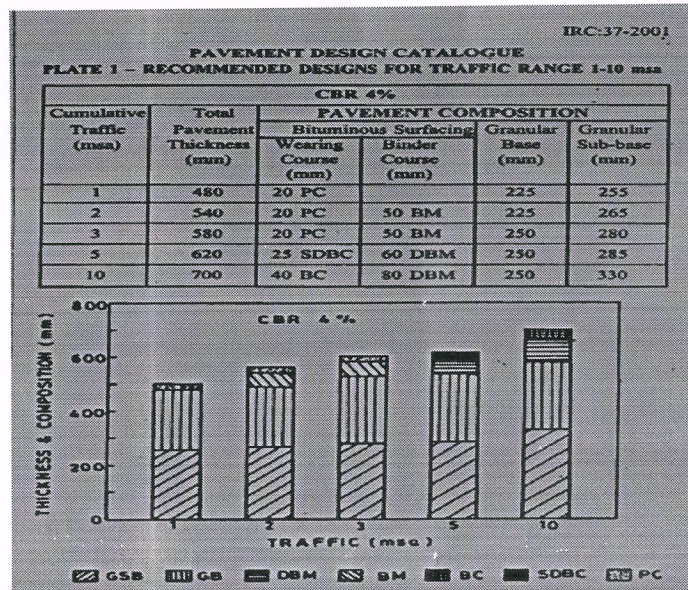
[Max. Marks: 30]

**(\*) Instructions to candidates:**

- 1) **Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6.**
- 2) **Figures to the right indicate full marks.**
- 3) **Use of scientific calculator is allowed**
- 4) **Use suitable data where ever required**

- Q.1 a List out various ON-Street parking facilities with the help of neat sketches 4 Marks
- Q.1 b Identify the types of grade separated intersections and their necessity. 6 Marks
- OR**
- Q2 a Justify the significance of Level of Service 'A' and 'F' of a road with the help of a neat sketch. 4 Marks
- Q2 b During a traffic survey the following data was recorded on a road network: 6 Marks
- a. Two wheelers - 1000
  - b. Cars - 600
  - c. Buses - 300
  - d. Auto – 250 and Cycle -50
- Determine PCU using IRC 106-1990.
- Q.3 a Identify the necessity of Pavement Management System for the maintenance of roads? 4 Marks
- Q.3 b With reference to Benkelman beam deflection study, estimate: 6 Marks
- a. Correction for pavement temperature.
  - a. Correction for seasonal variation in subgrade moisture content.
- OR**
- Q.4 a Identify the details of with neat sketches: 4 Marks
- a. Rutting
  - b. Block Cracking.
- Q.4 b Determine the Design parameters of a Flexible pavement for construction of a new bypass with the following data: 6 Marks
- a. Two lane carriage way
  - b. Initial traffic in the year of completion of construction = 400 CVPD (sum of both directions)
  - c. Traffic growth rate = 7.5 %
  - d. Design life = 15 years
  - e. Vehicle damage factor based on axle load survey = 2.5 standard axle per commercial vehicle
  - f. Design CBR of Subgrade soil – 4%





Q.5 a Distinguish the stresses on types of joints in cement concrete pavements. 4 Marks

Q.5 b A cement concrete pavement of thickness 18 cm, has two lanes of 7.2 m with a joint. Determine the Design parameters of the tie bars. Data: 6 Marks

- Thickness -  $h = 18$  cm,
- Allowable Tensile Stress -  $S_s = 1700 \text{ kg/cm}^2$
- Unit weight of Concrete -  $W = 2400 \text{ kg/cm}^2$
- Allowable Bond Stress -  $S_b = 24.6 \text{ kg/cm}^2$
- Coefficient of Friction -  $f = 1.5$
- Width of Panel -  $b = 7.2 / 2 = 3.6 \text{ m}$ .

**OR**

Q.6 a Identify the severity levels and extent level of distress in rigid pavements with the help of an example 4 Marks

Q.6 b Determine the length and spacing of tie bars given that the pavement thickness is 20cm and width of the road is 7m with one longitudinal joint. The unit weight of concrete is 2400 kg/m<sup>3</sup>, the coefficient of friction is 1.5, allowable working tensile stress in steel is 1750 kg/cm<sup>2</sup>, and bond stress of deformed bars is 24.6 kg/cm<sup>2</sup> 6 Marks