

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

III B.Tech I Sem Supply End Examination, July 2022

Transportation Engineering

(CIVIL)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

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|-------|---|----|-----|-----|
| 1. a) | State the historical development of highways? | 2M | C01 | BL1 |
| b) | What is the need of highway planning? | 2M | C01 | BL2 |
| c) | Distinguish Stopping sight distance and Overtaking sight distance? | 2M | C02 | BL4 |
| d) | In brief write the applications of concept of fiction? | 2M | C02 | BL3 |
| e) | What are the factors affecting LOS? | 2M | C03 | BL2 |
| f) | Describe the difference between at-grade and grade separated intersections? | 2M | C03 | BL4 |
| g) | What is flakiness index of aggregates? | 2M | C04 | BL1 |
| h) | What would you recommend for blending of aggregates used in mixes? | 2M | C04 | BL5 |
| i) | Draw typical cross sections of flexible and rigid pavements? | 2M | C05 | BL3 |
| j) | What are the critic load positions on rigid pavement and justify the same? | 2M | C05 | BL5 |

PART- B**(10*5 Marks = 50 Marks)**

- | | | | | | |
|-----------|----|--|-----|-----|-----|
| 2 | a) | In detail, discuss the salient features of the Lucknow Road Plan or the Third 20-Year Road Development Plan (1981-2001)? | 5M | C01 | BL2 |
| | b) | Appraise and discuss in detail the surveys required for the final location of a new highway. | 5M | C01 | BL5 |
| OR | | | | | |
| 3 | | What are the PPP schemes under taken by the Government of India for highway development? Write an overview? | 10M | C01 | BL2 |
| 4 | a) | Describe the elements of geometric design of highways? | 5M | C02 | BL2 |
| | b) | Define superelevation and how would you justify the factors that affect superelevation? | 5M | C02 | BL5 |

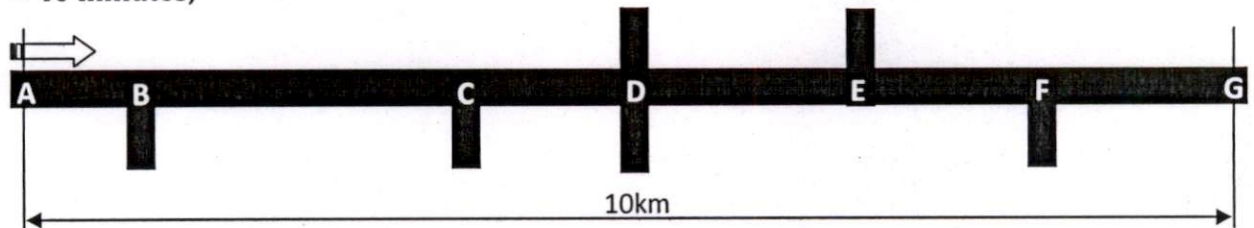
OR

5 A vehicle is travelling at an average speed of 80 km/h under the following conditions: (i) level surface and (ii) upward gradient of 2% and. Assume perception and brake reaction time = 2.5 seconds and coefficient of longitudinal friction between vehicle tyres and road surface = 0.35. Determine safe-stopping sight distances? 10M C02 BL4

- 6 a) Explain how traffic volume data is collected? List out the different forms of presentation of traffic volume data? 5M C03 BL2
 b) What are the objectives and various applications of spot speed data? 5M C03 BL2

OR

7 Determine the running speed and journey speed of a vehicle when travelled from A to G. Use the following field data: 10M C03 BL4
 Average total travel time including delays due to traffic at junctions = 40 minutes;



Average delays at junction B = 3 minutes, C = 2 minutes, D = 5 minutes, E = 3 minutes

- 8 a) Defend how viscosity of bitumen is useful? Explain any one method of viscosity measurement of bitumen? 5M C04 BL5
 b) How would you show your understanding on experimental method of determination of sub-grade reaction of soil? 5M C04 BL3

OR

- 9 Describe the Rothfuch's method of aggregate blending? Write its advantages and limitations? 10M C04 BL2
- 10 a) Write the critical combination of stresses and conclude which combination is critical in Indian climatic conditions? 5M C05 BL5
 b) Calculate the rebound surface deflection on a single layer pavement under a wheel load of 40 kN with a tyre pressure of 0.8 MPa. The effective elastic modulus of sub-grade may be taken as 40 MPa and Poisson's ratio of the soil as 0.5 5M C05 BL4

OR

- 11 Elaborate the salient features of the design of flexible pavement according to the guidelines of IRC:37-2012? 10M C05 BL6

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