

**INSTITUTE OF AERONAUTICAL ENGINEERING**

(Autonomous)

Dundigal-500043, Hyderabad

B.Tech VII SEMESTER END EXAMINATIONS (REGULAR) - FEBRUARY 2022

Regulation: R18

TRANSPORTATION ENGINEERING

Time: 3 Hours

(CE)

Max Marks: 70

Answer FIVE Questions choosing ONE question from each module
(NOTE: Provision is given to answer TWO questions from any ONE module)

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

MODULE – I

1. (a) Explain in detail about classification of roads based on third twenty year road development plan [7M]
- (b) Calculate the lengths of National and State highways required in a district with a total area of 7200 km^2 , developed, semi-developed undeveloped areas being 30, 45, 25 percent of the respective district. The no of towns with population over 1.0, 0.5 - 1.0, 0.2 - 0.5 and 0.1 - 0.2 lakhs are 3, 7, 12 and 20 respectively in a district using second twenty year plan. [7M]
2. (a) What are the significant recommendations of Jaykar committee report? Mention how did this help road development in India. [7M]
- (b) The area of a certain district in India is 18,400 sq.km and there are 16 towns as per 1981 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001. [7M]

MODULE – II

3. (a) What are the various factors affecting the highway geometric design? Describe the importance of geometric design. [7M]
- (b) A vertical summit curve is formed at the intersection of two gradients, +3.0 and -5.0 percent. Design the length of summit curve to provide a stopping sight distance for a design speed of 80kmph. Assume other data. [7M]
4. (a) Explain different types of gradients that can be provided on highway alignment. [7M]
- (b) The speeds of overtaking and overtaken vehicles are 80kmph and 60 kmph respectively. If the acceleration of the overtaking vehicle is 2.5Kmph per second, Calculate the safe overtaking sight distance for two way traffic. [7M]

MODULE – III

5. (a) What are the different types of studies which are carried out before laying pavements. [7M]
- (b) The load is applied on a pavement with the break efficiency of 2.6m width. Determine the average skid resistance. [7M]
6. (a) List out the various factors that cause accidents in traffic engineering and explain the engineering measures to reduce accidents. [7M]

- (b) A vehicle moving at 40kmph speed was stopped by applying brake and length of the skid mark was 12.2 m. If average skid resistance of the pavement is known to be 0.70, determine the brake efficiency of the test vehicle. [7M]

MODULE – IV

7. (a) Explain various types of at-grade intersections and explain them with neat sketches. [7M]
(b) What are different types of conflicts that are possible at intersections? Explain how many conflict points are possible for a 4 road junction with all the roads being two way, by using a diagram. [7M].
8. (a) What are the general causes of pavement failures? Explain the construction of bituminous pavements. [7M]
(b) What do you mean by surface dressing? Explain the role of surface dressing in the construction of highway. [7M]

MODULE – V

9. (a) Explain the procedure for construction of water bound macadam roads in highway construction. [7M]
(b) What is the need for maintenance of highways? Explain briefly the classification of maintenance works. [7M]
10. (a) Explain relative stiffness of slab to sub-grade. Describe the term modulus of sub-grade reaction and its importance in pavement design. [7M]
(b) Derive an expression for wheel load stresses in Westergaard's stress equation in rigid pavement. [7M]

