

Code: 19CE3502

III B.Tech - I Semester – Regular Examinations – JANUARY 2022**HIGHWAY ENGINEERING
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

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- Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 5 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each question carries 12 marks.
4. All parts of Question paper must be answered in one place
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PART – A

1. a) Mention the significance of Central Road Research Institute.
b) What is meant by super elevation?
c) Why do we need channelization in the design of intersection?
d) What are the various factors considered in design of pavements?
e) What are the types of highway construction?

PART – B**UNIT – I**

2. a) Explain the classification of road patterns with the help of neat sketches. 6 M
b) Discuss in brief about various features of first and second twenty year road plan. 6 M

OR

3. a) Discuss the necessity of realignment in a highway project? 6 M
- b) The area of a certain district in India is 25,800 sq.km and there are 16 towns as per 1991 census. Determine the lengths of different categories of roads to be provided in this district by the year 2001. 6 M

UNIT – II

4. a) Explain various factors controlling geometric design. 6 M
- b) Calculate the safe stopping sight distance for design speed of 80 kmph for two-way traffic on a single lane road. Assume $f=0.35$, reaction time=2.5 seconds, $g=9.8$ 6 M

OR

5. a) Describe in detail about parking studies in traffic engineering. Distinguish between on-street and off-street parking. 6 M
- b) What are the engineering and enforcement measures to reduce accident rates? 6 M

UNIT-III

6. a) Explain the design factors considered in rotary design. 6 M
- b) Mention various advantages and disadvantages of rotary design. 6 M

OR

7. a) What are the desirable properties of soil as a highway material? 6 M
- b) Discuss in detail CBR method used for evaluating stability of soil subgrade. 6 M

UNIT – IV

8. a) Explain the functions of the components of flexible pavements with the help of a neat sketch. 6 M
- b) Explain in brief any method of flexible pavement design. 6 M

OR

9. a) Why are joints provided in concrete pavement slab and explain in brief about various joints used in concrete pavement? 6 M
- b) Calculate the stresses at interior, edge and corner regions of a rigid pavement using Westergaard's method.
- Wheel load $P=4100\text{Kg}$; $E=3\times 10^5\text{kg/cm}^2$, h =slab thickness 20cm, μ =Poisson's ratio for concrete =0.15, k = Modulus of sub grade reaction 4.0kg/cm^2 , a =Radius of wheel load distribution=15cm. 6 M

UNIT – V

10. a) Explain in detail the construction of cement concrete pavements. 6 M
- b) Explain in detail the specification of materials used for WBM pavements. 6 M

OR

11. a) What is soil stabilization? Explain in brief about various techniques used in soil stabilization. 6 M
- b) Explain in detail about the principle and method involved in soil-lime stabilization. 6 M