

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY- GURAJADA VIZIANAGARAM**  
**II B. Tech I Semester Supplementary Examinations, November – 2024**  
**HIGHWAY ENGINEERING**  
**(CIVIL ENGINEERING)**

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

*Answer any FIVE Questions*  
*ONE Question from Each unit*  
*All Questions Carry Equal Marks*

\*\*\*\*\*

- |    |    |   |     |
|----|----|---|-----|
| 1  | a) | What are the various road patterns practiced? Explain   | [7] |
|    | b) | What are the salient features of Nagpur Road Development Plan? Explain  | [7] |
|    |    | (OR)  |     |
| 2  | a) | Explain the role of engineering surveys in finalizing highway alignment.  | [7] |
|    | b) | What are the most important events in the chronological history of the Development of Highways in India? Elaborate  | [7] |
| 3  | a) | Enumerate the various design factors controlling the vertical alignment of highways.  | [7] |
|    | b) | Calculate the safe stopping distance for design speed of 50kmph for two-way traffic on a two-lane road. Assume coefficient of friction as 0.35 and reaction time of driver as 2.5seconds.   | [7] |
|    |    | (OR)  |     |
| 4  | a) | What are the objectives of providing Transition curves? What are the methods used for computing the length of Transition curve?   | [7] |
|    | b) | The design speed of overtaking vehicle is 60 Kmph. The rate of acceleration of the above vehicle is 3.6 Kmph/sec. The difference in speed between overtaking and overtaken vehicle is 20 Kmph. Calculate OSD as per IRC guidelines for a road with two-way traffic. Draw the sketch of overtaking zone. | [7] |
| 5  | a) | What are the objectives of traffic volume studies and discuss about the role of 30 <sup>th</sup> hourly volume?   | [7] |
|    | b) | What are the objectives of Traffic Volume Studies? How the Traffic Volume Data is presented by various methods?   | [7] |
|    |    | (OR)  |     |
| 6  | a) | Explain about the classification of Traffic Signs and their specifications.   | [7] |
|    | b) | Discuss the guidelines of IRC method of Signals.  | [7] |
| 7  | a) | Explain the procedure of Impact Testing on Road aggregate with the help of a neat diagram.  | [7] |
|    | b) | Write about Marshall Mix Design.  | [7] |
|    |    | (OR)  |     |
| 8  | a) | Discuss the properties of bitumen.  | [7] |
|    | b) | Briefly explain about the laboratory CBR test.  | [7] |
| 9  | a) | Explain the CBR method of design of flexible pavements.   | [7] |
|    | b) | Compare various aspects of flexible and rigid pavement  | [7] |
|    |    | (OR)  |     |
| 10 | a) | Explain temperature stresses that are developed in cement concrete pavement.  | [7] |
|    | b) | Explain the IRC method of design of rigid pavements.  | [7] |

\*\*\*\*\*