

Roll No.:

SGT UNIVERSITY

END TERM THEORY EXAMINATION JULY-2022

| | | | |
|---------------------------|--------------------------|----------------|--------------------------|
| Faculty/College of Study: | Engineering & Technology | Year/Semester: | 6 th Semester |
| Program: | B.Tech. (CE) | Duration: | 03:00 Hrs |
| Course/Subject: | Highway Engineering | Maximum Marks: | 60 |
| Course/Subject Code: | 13010603 | Batch: | 2019 |

Instructions:-

1. Write Your Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided correct question paper. Complaint(s) in this regard, if any should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter.
3. All Questions are compulsory. Marks are indicated against each question.
4. Illustrate your answer with diagram wherever required.

SECTION-A

(Very Short Answer Type Questions)

Note: All Questions are compulsory: -

[12X1=12 Marks]

| S. No. | Question | Marks Allotted |
|--------|--|----------------|
| 1 | What is kerb stone? | 1 |
| 2 | How much percentile the design speed for an highway is consider? | 1 |
| 3 | What are the different types of kerbstone generally used in the highway construction? | 1 |
| 4 | Define carriageway width. | 1 |
| 5 | Maximum width of vehicle allowed as per IRC guidelines? | 1 |
| 6 | What is the relationship between headlight sight distance and stopping sight distance? | 1 |
| 7 | Define traffic separator? | 1 |
| 8 | Define impact factor? | 1 |
| 9 | Define camber. | 1 |
| 10 | Define right of way? | 1 |
| 11 | What is the maximum legal width of vehicle on Indian roads? | 1 |
| 12 | Define deflection angle for horizontal curve? | 1 |

SECTION-B
(Short Answer Type Questions)

Note: All Questions are compulsory: -

[4X2=8 Marks]

| S. No. | Question | Marks Allotted |
|--------|---|----------------|
| 13 | Define nominal maximum size of aggregate? | 2 |
| 14 | There is a horizontal curve of radius 60 m on a stretch of hill road with a gradient of 5.0%. Determine the grade compensation? | 2 |
| 15 | Define weaving, merging and crossing operation? | 2 |
| 16 | Define summit curve and draw the various conditions for summit curve formation? | 2 |

SECTION-C
(Descriptive Answer Type Questions)

Note: All Questions are compulsory: -

[4X4=16 Marks]

| S. No. | Question | Marks Allotted |
|--------|---|----------------|
| 17 | Explain briefly the broad classification of bitumen constituents? | 4 |
| 18 | Determine the minimum radius of circular horizontal curve for two lane road (3.5 m lane width) for the design speed of 30 kmph and 65 kmph? | 4 |
| 19 | A valley curve is formed by a descending grade of 1 in 25 meeting an ascending grade of 1 in 30. Design the length of valley curve to fulfil both comfort and headlight sight distance requirement for a design speed of 80 kmph. Assume allowable rate of change of centrifugal acceleration is 0.6 m/sec ³ . | 4 |
| 20 | Explain the types of bitumen ageing and name the corresponding test conducted to measure it? | 4 |

SECTION-D
(Long Answer Type Questions)

Note: All Questions are compulsory: -

[4X6=24 Marks]

| S. No. | Question | Marks Allotted |
|--------|--|----------------|
| 21 | Explain CBR test in details. | 6 |
| 22 | The speeds of overtaking and overtaken vehicle are 80 and 60 kmph respectively. If the acceleration of overtaking vehicle is 2.5 kmph per second, calculate safe passing sight distance for the following conditions (a) One-way traffic (b) Two way traffic | 6 |
| 23 | At a right angled intersection of two roads, Road-1 has four lanes with a total width of 12.0 m and Road-2 has two lanes with a width of 6.6 m. The volume of traffic approaching the intersection during design hour are 900 and 743 PCU/hour on the two approaches of Road-1 and 278 and 180 PCU/hour on the two approaches of Road-2. Design the signal timing as per IRC guidelines. | 6 |
| 24 | Derive the relationship for the stability of the vehicle on road without super-elevation and determine the value of super-elevation for horizontal highway curve of radius 500 m and speed 100 kmph. | 6 |