

Roll No.....

Total No. of Questions : 09]

[Total No. of Pages : 02

Paper ID [CE311]

(Please fill this Paper ID in OMR Sheet)

B. Tech. (Civil) (Sem. - 5th)

TRANSPORTATION ENGINEERING - I (CE - 311)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

(10 × 2 = 20)

- Q1) a) Briefly explain: Central Road Research Institute and Highway Research Board.
- b) What are expressways?
- c) Differentiate between slip and skid.
- d) Discuss the necessity of providing super elevation on roads.
- e) What is extra widening and why it is provided?
- f) List the various tests conducted on aggregates to be used for highways.
- g) What is Mastic Asphalt?
- h) Discuss relative merits and demerits of parallel and angle type of kerb parking.
- i) Briefly discuss different types of drains used in hill roads.
- j) Calculate stopping sight distance for a road for which the design speed is 50 kmph. The brake efficiency is 40% and reaction time of the driver is 2.5 seconds.

Section - B

(4 × 5 = 20)

- Q2) What are planning surveys? Explain the objective of each survey with regards to road planning.
- Q3) Calculate the super elevation to be provided for a horizontal curve with radius 400 m for a design speed of 90 kmph in plain terrain. Comment on the results. What is the coefficient of lateral friction mobilized if super elevation is restricted to 0.07?
- Q4) A descending gradient of 1 in 25 meets an ascending gradient of 1 in 30. Calculate the length of the valley curve; assume design speed as 60 kmph.
- Q5) What is the function of transition curve in road alignment? Determine the length of transition in a horizontal alignment for a speed of 96 kmph and radius of curve as 345 m.
- Q6) (a) State different type of traffic signals used at road crossings and state their relative merits.
(b) Discuss the various types of road signs.

Section - C

(2 × 10 = 20)

- Q7) (a) Write down the construction steps of water bound macadam road.
(b) Explain the requirements of joints filler and sealer. Discuss the desirable properties and various materials in use.
- Q8) What are the factors that contribute to select the alignment of roads in plains as well as hill terrain? How do geological conditions affect the location?
- Q9) (a) What are various tests carried out on bitumen? Briefly mention the principle and uses of each.
(b) Briefly explain mud pumping and bleeding.