Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: B.Tech/IDD
Sub_Code: CICP3002

5th Semester Regular Examination: 2025-26
SUBJECT: TRANSPORTATION ENGINEERING
BRANCH(S): C&EE, CIVIL, CE
Time: 3 Hours
Max Marks: 100
Q.Code: U199

Answer Q1 (Part-I) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right-hand margin indicate marks.
Design codes are not allowed during examination.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) What are the classifications of road as per Lucknow Road plan in India?
b) Differentiate between Lay Bay and Bus Bays.
c) What do you mean by intermediate lane road? Why it is provided?
d) What are the factors on which overtaking sight distance depend?
e) What is the significance of 98^{th}, 85^{th}, and 15^{th} percentile speed?
f) What is the significance of angularity test of aggregate?
g) Define Jam density.
h) Why dowel bar and tie bars are provided in rigid pavement?
i) Mentioned the lane distribution factors for different types of roads.
j) Differentiate between Inflation and salvage value.

Part-II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Calculate the road length required for a district based on Nagpur Road plan, following data are given below:

- Total area = 8000 km^2
- Agricultural area = 3400 km^2
- Length of railway track = 75 km
- Numbers of villages with population range < 500, 501-1000, 1001-2000, 2001-5000, and above 5001 are 408, 310, 100, 55, and 18 respectively.
- Number of towns and village with population range 2001-5000 and 5001- 10000 are 130 and 45 respectively.

b) Discuss briefly the special care to be taken while aligning hill road.
c) What are the salient features of Central Road Fund Act, 2000?
d) Derive an expression for finding the Superelevation required on horizontal curve.
e) A valley curve is formed by descending gradient of 2.5 % which meets an ascending gradient of 4.5 %. Design the total length of valley curve if the design speed is 20 m/sec so as to fulfill both comfort condition and head light sight distance. Allowable rate of change of centrifugal acceleration is 0.6 m/sec^3, beam angle is 1° and height of the head light above carriageway is 0.9 m.

f) Calculate the safe overtaking sight distance for a two-way two-lane SH for a design speed of 22 m/sec, acceleration of overtaking vehicle is 0.99 m/sec^2. Assume all other data as per IRC.

g) Explain the merits and demerits of different types of transition curve used in the horizontal alignment of highways.

h) Show in figure; the relationship between speed, travel time, volume, density, and capacity.

i) What are the procedures for conducting Softening point test of bitumen?

j) Explain ESWL with a suitable example.

k) Discuss Westergaard's concept of temperature stress in rigid pavement.

l) What are the importances of highway economic studies in India?

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Briefly explain the engineering surveys needed for locating a new highway. **(16)**

Q4 What are the uses of origin and destination studies? Explain briefly different methods for carrying out O & D survey. **(16)**

Q5 Briefly summaries the changes in IRC: 37-2001, IRC: 37-2012, and IRC: 37-2018 guide line for design of flexible pavement. **(16)**

Q6 Explain the concept of various methods of economic evaluation of highway project. What are the drawbacks of different methods? **(16)**