B.E/B.TECH DEGREE EXAMINATIONS: NOV / DEC 2024

(Regulation 2018)

Fourth Semester

CIVIL ENGINEERING

U18CEI4202: Highway and Traffic Engineering

IRC 37 and 58 Permitted

COURSE OUTCOMES

CO1:   Acquire knowledge about the surveys involved in planning and highway alignment.

CO2:   Design the geometric elements of highways and expressways.

CO3:   Apply the knowledge of the traffic studies and implement traffic regulation and control measures and intersection design.

CO4:   Characterize pavement materials and design flexible and rigid pavements as per IRC.

CO5:   Understand the concepts of pavement distress and methods to evaluate and maintain the Pavement.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. Summarize any two recommendations of Jayakar Committee.	CO1	[K$_2$]
2. Illustrate the meaning of obligatory points.	CO1	[K$_2$]
3. Calculate the equilibrium super elevation required on a two-lane SH curve on a plain terrain having a radius of 300 m.	CO2	[K$_3$]
4. Distinguish between summit and valley curves.	CO2	[K$_2$]
5. Define Level of Service concept.	CO3	[K$_1$]
6. Write the differences between 'Time Mean Speed' and 'Space Mean Speed'.	CO3	[K$_2$]
7. Differentiate flexible pavement from rigid pavement.	CO4	[K$_2$]
8. Why geotextiles are used in pavements?	CO4	[K$_2$]
9. State the use of Falling Weight Deflectometer.	CO5	[K$_1$]
10. Explain mud-pumping in rigid pavements.	CO5	[K$_{\backslash 2}$]

11.		Explain in detail the engineering surveys to be conducted for highway alignment. Also write a comparison between the conventional and modern method of surveys employed.	16	CO1	[K_2]
12.	a)	The design speed of a highway is 80 kmph. There is a horizontal curve of radius 200 m on a certain locality. Safe limit of transverse co-efficient of friction is 0.15. Calculate the super-elevation required to maintain this speed. If the maximum super-elevation of 0.07 is not to be exceeded, calculate the maximum allowable speed on this horizontal curve as it is not possible to increase the radius.	8	CO2	[K_3]
	b)	Calculate the safe overtaking sight distance required for a two-lane two-way road with a design speed of 100 kmph. What is the minimum length of overtaking zone required? Draw a neat sketch of the overtaking zone and show the positions of the sign posts. Assume any data required suitably.	8	CO2	[K_3]
13.	a)	Explain in detail the various Origin-Destination surveys conducted in traffic studies.	10	CO3	[K_2]
	b)	With a neat sketch, explain the features of cloverleaf interchange.	6	CO3	[K_2]
14.	a)	The initial traffic after completion of construction of a four-lane divided National Highway is estimated to be 3500 CVPD. Design the flexible pavement using the following data: Design CBR value = 8% Growth rate of traffic = 7.5% Design life = 15 years VDF = 4 LDF = 0.45	8	CO4	[K_3]
	b)	Summarize the step-by-step design procedure of rigid pavements as per IRC 58.	8	CO4	[K_2]
15.		Briefly explain the various defects in flexible pavements highlighting their causes and remedial measures.	16	CO5	[K_2]
16.		Explain how Benkelman Beam Deflection study is conducted and overlay is designed as per BBD results.	16	CO5	[K_2]

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