CBCS SCHEME - Make-Up Exam

USN | | | | | | | | | | |

BCV403

Fourth Semester B.E/B.Tech. Degree Examination, June/July 2025
Transportation Engineering

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. Missing data, if any, may be suitably assumed. .

		Module – 1	M	L	C
1	a.	List the various major recommendations of Jayakar Committee. How this helped in road development in India.	6	L1	CO1
	b.	List the various factors affecting highway alignment. Explain these with neat sketches.	6	L1	CO1
	c.	Calculate the stopping sight distance for a vehicle moving with a design speed of 80 kmph on a level road and on a gradient of 1 in 100.	8	L2	CO1
		OR			
2	a.	Explain the various practical design steps in the calculation of super deviation on a horizontal curve.	6	L1	CO1
	b.	With neat sketches, explain various road patterns.	6	L1	CO1
	c.	An ascending gradient of 1 in 100 meets a descending gradient of 1 in 120. Design the length of summit curve to be designed for a vehicle moving with a speed of 80 kmph so as to have an OSD of 470 m.	8	L2	CO1
		Module – 2			
3	a.	List the various properties of coarse aggregate and the tests to be conducted to determine each property.	6	L2	CO2
	b.	Explain the various differences between flexible pavement and rigid pavement.	6	L2	CO2
	c.	The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 1.0 m^3/sec. design the cross section and longitudinal slope of the trapezoidal drain assuming the bottom width of the trapezoidal section and cross slope suitably. The allowable velocity of flow in the drain is 1.2 m/sec and Manning's roughness coefficient is 0.02.	8	L3	CO2
		OR			
4	a.	List and explain various describable properties of subgrade soil.	6	L2	CO2
	b.	What are the various factors governing pavement design. List and explain all of them.	6	L1	CO2
	c.	Discuss the importance of highway drainage.	8	L2	CO2

Module – 3

5	a.	Explain reaction time and PIEV theory with sketch.	6	L1	CO3
	b.	Define PCU. List and explain the various factors governing PCU at different locations.	6	L1	CO3
	c.	Following data were obtained from the spot speed studies. Determine : i) Upper and lower limits of speed for regulation ii) Design speed for checking the geometric design elements of the highway.	8	L1	CO3

Speed range (kmph)	Number of vehicles	Speed range (kmph)	Number of vehicles
5 – 10	230	30 – 35	430
10 – 15	375	35 – 40	290
15 – 20	500	40 – 45	110
20 – 25	680	45 – 50	25
25 – 30	525	50 – 55	8
		55 – 60	1

OR

6	a.	List the objectives of : i) O and D studies ii) Accident studies.	6	L1	CO3
	b.	List and explain various types of traffic signs, with neat sketches.	6	L2	CO3
	c.	A vehicle of weight 2.0 tonnes skids through a distance equal to 40 m before colliding with another parked vehicle of weight 1.0 tonne, and after collision, skids through 12 m before stopping. Calculate the initial speed of the moving vehicle. Assume coefficient of friction as 0.5.	8	L3	CO3

Module – 4

7	a.	Explain coning of wheels and tilting of rails, with neat sketch.	6	L2	CO4
	b.	Draw a typical cross section of permanent way and explain the functions of each element in it.	6	L2	CO4
	c.	Calculate the quantity of materials required to constructs 1.2 km long BG track. Take sleeper density as m + 4, length of rail = 13 m.	8	L3	CO4

OR

8	a.	Explain the various track fittings and fasteners.	6	L2	CO4
	b.	Mention and list the various requirements of ideal permanent way.	6	L2	CO4
	c.	Explain the classification of railway station.	8	L2	CO4

		Module – 5			
9	a.	List the various factors to be considered in the selection of site for an airport.	6	L2	CO4
	b.	Explain the various types of classification of airports.	6	L2	CO4
	c.	The length of runway under standard conditions is 1620 m. The airport site has an elevation of 270 m. Its reference temperature is 32-90°C. If the runway is to be constructed with an effective gradient of 0.20 percent, determine the corrected runway length.	8	L3	CO4
		OR			
10	a.	Explain the type 1 wind rose diagram for orienting the runway.	6	L2	CO4
	b.	List and explain the various aircraft characteristics.	6	L2	CO4
	c.	Design an exit taxi way joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turn off speed is 80 kmph. Take R_1 = 731 m for 80 kmph speed.	8	L3	CO4

* * * * *