CBCS SCHEME

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BCV403

Fourth Semester B.E./B.Tech Degree Supplementary Examination, June/July 2024

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.

		Module – 1	M	L	C
Q.1	a.	Explain the details of Jayakar committee and their recommendations.	10	L2	CO1
	b.	The speed of overtaking and overtaken vehicles are 70 and 40 kmph respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99m/s^2. i) Calculate safe overtaking sight distance ii) Mention the minimum length of overtaking zone iii) Draw a neat sketch of overtaking zone and show the positions of sign posts.	10	L3	CO1
		OR			
Q.2	a.	List the types of road patterns. With usual notations draw any 4 road patterns.	10	L2	CO1
	b.	Calculate the length of transition curve and the shift using the following data : Design speed = 65 kmph Radius of circular curve = 220m Allowable rate of introduction of super elevation (pavement rotated about the centre line) = 1 in 150 Pavement width including extra widening = 7.5m.	10	L3	CO1
		Module – 2			
Q.3	a.	Explain the various applications of bituminous emulsion.	10	L2	CO2
	b.	Briefly explain the desirable properties of aggregates.	5	L2	CO2
	c.	Discuss the importance of highway drainage.	5	L2	CO2
		OR			
Q.4	a.	List and explain types of joints used in rigid pavement.	10	L2	CO2
	b.	The maximum quantity of water expected in one of the open longitudinal drain on clayey soil is 0.9m^3/s. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of trapezoidal section to be vertical : 1.5 horizontal. The allowable velocity of slow in the drain is 1.2m/s and Manning's roughness coefficient is 0.02.	10	L3	CO2
		Module – 3			
Q.5	a.	Explain the various road user characteristics.	10	L2	CO3
	b.	A vehicle of weight 2 tonnes skids through a distance equal to 40m before colliding with another parked vehicle of weight 1 tonne. After collision both the vehicles skids through a distance 12m before stopping. Compute the initial speed of the moving vehicle. Assume coefficient of friction as 0.5.	10	L3	CO3

		OR			
Q.6	**a.**	Explain the various vehicular characteristics.	**10**	**L2**	**CO3**
	b.	At a right angle intersection of two roads, road 1 has four lanes with a total width of 12m and road 2 has two lanes with a total 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 two approaches of Road 2. Design the signal timings as per IRC guidelines.	**10**	**L3**	**CO3**
		Module – 4			
Q.7	**a.**	Explain : i) Coning of wheels ii) Tilting of roads.	**10**	**L2**	**CO4**
	b.	For 12.8m rail length of BG track, calculate the quantity of materials required per kilometer length of track. Assume sleeper density to be equal to M+4. Type of rail – 90R.	**10**	**L3**	**CO4**
		OR			
Q.8	**a.**	Briefly explain : i) Permanent way ii) Railway station and yards.	**10**	**L2**	**CO4**
	b.	If 8° curve track diverges from a main curve of 5° in an opposite direction in the layout of a BG yard, calculate the super elevation and the speed on the branch line, if the maximum speed permitted on the main line is 45 kmph.	**10**	**L3**	**CO4**
		Module – 5			
Q.9	**a.**	List and explain the aircraft characteristics affecting design and planning of airport.	**10**	**L2**	**CO5**
	b.	Explain the details of wind rose diagrams.	**10**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the factors to be considered for selection of airport site.	**10**	**L2**	**CO5**
	b.	The length of runway under standard condition is 126.m. The airport site has an elevation of 270m. 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.	**10**	**L3**	**CO5**

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