B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E.   Semester: VI
Branch: Civil Engineering   Duration: 3 hrs.
Course Code: 20CV6PCTRE   Max Marks: 100
Course: Transportation Engineering - II   Date: 05.07.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I	CO	PO	Marks
1	a)		Discuss the role of railways in transportation.	CO1	PO2	6
	b)		Discuss the requirements of an ideal permanent way with a neat sketch.	CO1	PO2	6
	c)		Explain the meaning of coning of wheels and tilting of rails. What are its advantages and disadvantages?	CO1	PO2	8
			UNIT - II			
2	a)		Mention different types of Ballast and Sleepers.	CO1	PO2	6
	b)		Calculate the quantity of materials required for the construction of BG track having length 19.5km using the following data – i) Rail section - 52 kgs/m ii) Standard length -12.8m i) Sleeper density of (M+5).	CO1	PO3	8
	c)		Calculate the maximum permissible train load that can be pulled by a locomotive having four pairs of driving wheels carrying an axle load of 24 tonnes each. The train has to run at a speed of 80kmph on a straight level BG track.	CO1	PO3	6
			UNIT - III			
3	a)		In a layout of a BG yard, a 6° curve branches off from a 3° main curve in opposite direction. If the speed is restricted to 22 kmph on branch line and permissible value of cant deficiency is 7.61 cm, determine the speed restriction on main line.	CO2	PO3	8
	b)		Discuss the necessity of geometric design for a railway track.	CO2	PO2	4
	c)		Determine the hauling power of locomotive having four pair of driving wheels, carrying an axle load of 28.42 tonnes each, on BG track with a ruling gradient of 1 in 200 and maximum curvature of 3° at a speed of 48.3 kmph.	CO2	PO3	8
			OR			

				CO	PO	
4	a)	List the different types of gradients and define them.		*CO2*	*PO3*	**6**
	b)	Notate the Empirical formulae to find the speed on a railway track for BG, MG and NG lines.		*CO2*	*PO2*	**6**
	c)	Calculate the maximum permissible speed on the curve if on a 8° MG track, the average speed of different trains is 50 kmph and allowable cant deficiency is half that of maximum cant deficiency. (Cant deficiency for MG =5.1 cm)		*CO2*	*PO2*	**8**
		UNIT - IV				
5	a)	Discuss the procedure of orientation of runway by using wind rose diagram method with a neat sketch given the direction, duration and intensity of wind.		*CO2*	*PO2*	**6**
	b)	The length of runway under standard conditions is 1620m.The airport site is at elevation of 270m.The reference temperature is 32.94^{o} C. If the runway is to be constructed with an effective gradient of 0.20 percent, determine the corrected runway length.		*CO2*	*PO3*	**8**
	c)	Explain about the factors to be considered for selecting a site for an airport.		*CO2*	*PO2*	**6**
		OR				
6	a)	Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and turn off speed is 80kmph. Take R_{1}=731m.		*CO3*	*PO2*	**8**
	b)	What are the assumptions to be made to define the basic runway length?		*CO3*	*PO2*	**6**
	c)	Mention the differences between the two methods of orienting the runway for an airport.		*CO3*	*PO2*	**6**
		UNIT - V				
7	a)	Discuss the advantages and disadvantages of tunnels.		*CO3*	*PO2*	**6**
	b)	List the harbours based upon the utility and discuss the requirements of any two types of harbours.		*CO3*	*PO2*	**8**
	c)	Explain briefly the factors considered while selecting a site for a harbour.		*CO3*	*PO2*	**6**

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