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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.   Semester: VI
Branch: Civil Engineering   Duration: 3 hrs.
Course Code: 20CV6PCTRE   Max Marks: 100
Course: Transportation Engineering - II   Date: 22.09.2023

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

1	a)	Discuss the basic requirements of an ideal alignment of railway lines and the factors involved in the selection of good alignment.	**08**
	b)	Draw a neat sketch of the cross section of B.G track in embankment on a straight track.	**04**
	c)	Differentiate between flat footed rails and Bull headed rails with neat sketches.	**08**

UNIT - II

2	a)	Discuss the requirements and failures of fishplate.	**06**
	b)	Calculate the number of sleepers required to construct a B.G track of 900 m length with Sleeper density of M+5.	**04**
	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 80 kmph on a straight level B.G track. Also calculate the reduction in speed, if the train has to climb a gradient of 1 in 200. If the train climbs the gradient with a 2° curve, then what would be the reduction in speed?	**10**

UNIT - III

3	a)	Define Gradient. Explain the different types of gradients provided on the railway track.	**06**
	b)	Derive a relationship between Radius and Versine of a curve.	**06**
	c)	Determine the equilibrium cant on a 2° curve on a broad gauge, if 15 trains, 11 trains, 8 trains, 5 trains and 3 trains are running at a speed of 55 kmph, 65 kmph, 75 kmph, 85 kmph and 100 kmph respectively.	**08**

OR

4	a)	Discuss the necessity of Geometric Design for a Railway Track.	**06**
	b)	Discuss the dynamic effects caused due to increase in speed of the train.	**06**

	c)	A 5° curve diverges from a 3° main curve in the reverse direction in the layout of a B.G yard. If the speed on the branch line is restricted to 35 kmph, determine the restricted speed on the main line.	**08**

UNIT - IV

5	a)	Draw a neat sketch of layout of an Aircraft and label its components.	**05**
	b)	With the aid of a neat wind rose diagram, explain runway orientation using the Type 2 method.	**07**
	c)	Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turn off speed is 80 kmph. Draw a neat sketch and show therein all the design elements.	**08**

OR

6	a)	List the factors affecting the selection of site for an airport and discuss any two of them.	**06**
	b)	Mention the factors affecting the design of an exit taxiway connecting runway and parallel taxiway.	**06**
	c)	An airport is proposed at an elevation of 420m above the mean sea level. The mean of the maximum and the mean of average daily temperatures of the hottest month of the year are 45°C and 27°C respectively. The maximum difference in elevation along the proposed profile of the runway is 7.5m. If the basic runway length of the runway is 1200m, determine the actual length of runway to be provided.	**08**

UNIT - V

7	a)	Discuss the advantages and disadvantages of tunnels.	**08**
	b)	Classify the different types of harbours. Mention the factors affecting the design of a harbor and explain any two briefly.	**08**
	c)	List the component parts of a harbour with a neat sketch.	**04**

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