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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B. E. - Civil Engineering

Semester End Examination; July / August - 2022

Transportation Engineering

Time: 3 hrs *Max. Marks: 100*

Course Outcome

The Students will be able to:

CO1: Apply the knowledge of science and engineering to acquire the fundamentals of different modes of transportation, engineering surveys, and project preparation and study of different types of pavements.

CO2: Design of highway geometric elements in relation to safety and driver comfort.

CO3: Identify different components of railway track and selection of appropriate materials for construction

CO4: Plan and design of airport runway and to understand the components of harbor and tunnels and their classification

Note: *i) **PART-A** is compulsory. One question from each unit for maximum of 2 marks.*
*ii) **PART-B** Answer any **TWO** sub questions (from a, b, c) from each unit for a Maximum of 18 marks.*

Q. No.	Questions	Marks	BLs	COs	POs
	I:PART - A	**10**			
I a.	List the classification of roads based on location and function.	2	L1	CO1	PO1,12
b.	Enumerate the objectives of camber.	2	L2	CO2	PO3,6,12
c.	List the objectives of highway drainage.	2	L1	CO3	PO1,4
d.	Define coning of wheels.	2	L1	CO3	PO1,4
e.	Define wind rose diagram and mention its types.	2	L1	CO4	PO1,3
	II:PART - B	**90**			
	UNIT - I	**18**			
1 a.	Mention different modes of transportation. Explain the characteristics of road transport in comparison with other systems.	9	L1	CO1	PO1,12
b.	Explain the factors controlling alignment.	9	L2	CO1	PO1,12
c.	Draw a sketch of cross section of a flexible pavement and describe the functions of each layer.	9	L3	CO1	PO1,12
	UNIT - II	**18**			
2 a.	Define gradient and explain types of gradient.	9	L1	CO2	PO3,6,12
b.	Define sight distance and explain factors restrictions of sight distance.	9	L1	CO2	PO3,6,12
c.	Design the rate of super elevation for a for a horizontal highway curve of radius 500 m and speed 100 kmph.	9	L3	CO2	PO3,6,12
	UNIT - III	**18**			
3 a.	What are the desirable properties of road aggregates? What tests are conducted for judging the desirable properties? Mention the significance of each test.	9	L1	CO3	PO1,4

Contd…2

b.	With sketches, explain how the sub surface drainage system is provided to lower the water table?	9	L2	CO3	PO1,4,8
c.	The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is 0.9 m^3/sec. Design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0 and cross slope to be 1.0 m vertical to 1.5 horizontal. The allowable velocity of flow in the drain is 1.2 m/sec and n = 0.02.	9	L3	CO2	PO3,6,12
	UNIT - IV	**18**			
4 a.	Define permanent way. Explain the requirements of ideal permanent way.	9	L1	CO3	PO1,4
b.	Define Creep. What are the causes, effects and prevention of creep?	9	L1	CO3	PO1,4
c.	Enumerate the functions and requirements of sleeper.	9	L2	CO3	PO1,4
	UNIT - V	**18**			
5 a.	What is basic runway length? Explain various corrections to be applied to it.	9	L1	CO4	PO1,3
b.	List different types of tunnels and mention the advantages and disadvantages of each.	9	L1	CO4	PO1,3
c.	Draw a neat sketch of artificial harbor. Explain the various components.	9	L2	CO4	PO1,3

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