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

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Civil Engineering

Semester End Examination; August - 2023

Traffic Engineering

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Understand the human factors and vehicular factors in traffic engineering design.

CO2: Conduct different types of traffic surveys and analysis of collected data

CO3: Understand the concept of traffic signal design and influence of traffic on environment

CO4: Understand the basic knowledge of transportation management and ITS.

***Note**: I) **PART - A** is compulsory. **Two** marks for each question.*

*II) **PART - B**: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.*

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	**10**			
1 a.	What the objectives are of traffic Engineering?	2	L1	CO1	PO1,7
b.	Explain origin and destination study.	2	L1	CO2	PO3,4
c.	What are the advantages of traffic signals?	2	L1	CO3	PO3,7
d.	List different measures to prevent accidents.	2	L1	CO4	PO4,5,11
e.	List the travel demand management technique.	2	L1	CO4	PO4,5,11
	II : PART - B	**90**			
	UNIT - I	**18**			
2 a.	Explain various human factors affecting road design and traffic performance.	9	L2	CO1	PO1,7
b.	Discuss on fundamental relationship between speed, flow and density.	9	L2	CO1	PO1,7
c.	A car weighing 2 tonnes is required to accelerate at rate of 2.3 m/s^2 in the second gear from a speed of 10 kmph. The upward gradient is+3% and the coefficient of rolling resistance is 0.022. The frontal area of the car is 2.15m^2 and the coefficient of air resistance is0.39 kg/m^3. The car tyre have the radius of 0.33m. The inflation pressure reduces this by a factor 0.915. The rear axle gear ratio is 3.90:1 and the first gear ratio is 2.70:1.Calculate the engine power needed and the speed of the engine in RPM. Assume transmission efficiency of 0.90.	9	L3	CO1	PO1,7
	UNIT - II	**18**			
3 a.	Enumerate the different methods of carrying out traffic volume studies. Indicate the principle of each.	9	L2	CO2	PO3,4
b.	Explain spot speed, running speed, space mean speed, time mean speed and average speed. How spot speed studies are carried out.	9	L2	CO2	PO3,4

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	c.	A vehicle of weight 4 tonnes skids through a distance equal to 40 m before colliding with another parked vehicle. The weight of which is75% of the former. After collision if both the vehicles skids through 14 m before stopping. Compute the initial speed of moving vehicle. Assume friction coefficient of 0.62.	9	L3	CO2	PO3,4
		UNIT - III	**18**			
4	a.	Explain grade separated intersection with its advantage and limitations.	9	L3	CO3	PO3,7
	b.	Explain briefly the various design factors to be considered in rotary intersection design.	9	L3	CO3	PO3,7
	c.	List the various measures adopted to increase pedestrian safety.	9	L2	CO3	PO3,7
		UNIT - IV	**18**			
5	a.	Describe the measures adopted to control air pollution from automobiles.	9	L2	CO4	PO4,5,11
	b.	Describe the deleterious effect of noise on human health.	9	L2	CO4	PO4,5,11
	c.	Briefly discuss the different causes of traffic accidents.	9	L2	CO4	PO4,5,11
		UNIT - V	**18**			
6	a.	List the traffic regulatory measures and explain them in brief.	9	L1	CO4	PO4,5,11
	b.	Describe the various strategies involved in traffic demand management.	9	L2	CO4	PO4,5,11
	c.	Explain the importance and applications of ITS in traffic engineering.	9	L2	CO4	PO4,5,11

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