

**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; July / Aug. - 2022****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 a Maximum of **18** marks from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
I : PART - A		10			
I a.	List the static and dynamic parameters considered in vehicular characteristics.	2	L1	CO1	1,7
b.	List the methods of conducting O & D studies.	2	L1	CO2	3,4
c.	List any 4 factors considered in design of rotary intersection.	2	L1	CO3	3,7
d.	List the advantages of integration of public transportation.	2	L1	CO3	3,7
e.	Define TDM [Travel Demand Management].	2	L1	CO4	4,5,11
II : PART - B		90			
UNIT - I		18			
1 a.	Explain the various human characteristics affecting road design and traffic performance.	9	L2	CO1	1,7
b.	Discuss briefly on the scope of traffic engineering.	9	L2	CO1	1,7
c.	A passenger car weighing 2 tonnes is required to accelerate at rate of 3 m/s^2 in the first gear from a speed of 10 kmph to 20 kmph. The gradient is +1% and the road have a bituminous surfacing. The Frontal projection area of the car is 2.15 m^2 . The car tyres have a radius of 0.33 m. The rear axle gear ratio is 3.82:1 and first gear ratio is 2.78:1. Calculate the engine horse power needed and the speed of the engine. Make suitable assumptions. Coefficient of air resistance = 0.39, coefficient of rolling resistance = 0.02, tyre deformation factor = 0.935, transmission efficiency = 0.9.	9	L3	CO1	1,7
UNIT - II		18			
2 a.	Discuss the objectives of traffic volume studies and speed and delay studies.	9	L2	CO2	3,4
b.	Discuss briefly about road side interview and home interview method to collect O & D data.	9	L2	CO2	3,4

- c. Spot speed studies were carried out at a certain stretch of a highway and the consolidated data collected are given below.

Speed range, kmph	0 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100
No. of Vehicles observed	12	18	68	89	204	255	119	43	33	09

9 L3 CO2 4,5

Determine;

- i) The upper and lower speed limit for regulation of traffic
- ii) Geometric design speed
- iii) Speed dispersion
- iv) Modal Speed

UNIT - III

18

- 3 a. Discuss briefly about advantages and disadvantages of Grade separation. 9 L2 CO3 3,7
- b. List the various measures adopted to increase pedestrian safety. 9 L1 CO3 3,7
- c. The average normal flow of traffic on cross roads A and B during design period are 400 and 250 PCU/hr, the saturation flow values on these roads are estimated as 1250 and 1000 PCU/hr respectively. The all red-time required for pedestrian crossing is 12 seconds. Design two phase traffic signal by Webster's method. 9 L3 CO3 3,7

UNIT - IV

18

- 4 a. Discuss briefly about causes and effects of road accidents. 9 L2 CO3 3,7
- b. Explain briefly the causes of air pollution and noise pollution due to traffic. 9 L2 CO3 3,7
- c. Explain briefly the advantages and disadvantages of Non-Motorized transport. 9 L2 CO3 3,7

UNIT - V

18

- 5 a. Discuss briefly about traffic regulatory measures to ease traffic flow. 9 L2 CO4 4,5,11
- b. Briefly discuss the advantages and disadvantages of one way streets. 9 L2 CO4 4,5,11
- c. Explain the importance and application of ITS in traffic engineering. 9 L2 CO4 4,5,11

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