



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Civil Engineering

Semester End Examination; Dec. - 2019

Traffic Engineering

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

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| 1 a. | Enumerate the road user characteristics affecting the traffic operation. | 8 |
| b. | Explain briefly various factors in PIEV theory with neat sketch. | 6 |
| c. | In a road test for measuring the skid resistance using skid resistance equipment, the timer indicating 4.3 seconds after the break application. Breaking distance was measured to be 35 m before the vehicle brought to halt. What is the average skid resistance of the surface? | 6 |
| 2 a. | Explain briefly the various resistances to motion of a vehicle. | 8 |
| b. | Explain the scope of traffic engineering. | 6 |
| c. | A passenger car weighing 2.5 tonnes is required to accelerate at a rate of 3.5 m/s^2 in the first gear from a speed of 10 kmph to 20 kmph. The gradient as +1.2% and the road has a black topped surface, with a frictional coefficient of 0.02. The frontal projection area of the car is 2.5 m^2 with $C_a = 0.37$. The car has tyres of radius 0.35 m with a $K = 0.935$. The rear axle gear ratio is 3.85:1 and the first gear ratio of 2.98:1. Assume transmission efficiency of 0.9 and hence calculate engine horsepower needed and speed of the engine in rpm. | 6 |

UNIT - II

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|------|--|---|
| 3 a. | Define the term spot speed with a neat sketch and explain the method of enascope for measuring spot speed. | 8 |
| b. | What are Flow, Concentration and Density? Explain the detailed field procedure of moving observer method. | 6 |
| c. | Enumerate the advantages of carrying out vehicle volume count survey. | 6 |
| 4 a. | What is the need for carrying out O-D survey? List and explain any two methods to carryout O-D survey. | 8 |
| b. | Define parking index. Explain parking space inventory method with a neat sketch. | 6 |
| c. | Explain briefly various design standards of an expressway. | 6 |

UNIT - III

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| 5 a. | What are the objectives of accident studies? Outline the causes of accidents. | 8 |
| b. | Explain the importance of 3E's in the field of accident studies. | 6 |

- c. The accident data pertaining to a metropolitan city for the year 1965 and 1970 are given below:

	1965	1970
Accidents	300	400
Vehicle-Kilometer of travel	250 million	300 million

6

Test whether there is any significant increase in the accident rates in two years.

- 6 a. Describe the fundamental relationship between speed, flow and density. 10
 b. What is level of service? Describe the concept of LOS as per Highway Capacity Manual. 10

UNIT - IV

- 7 a. Discuss the various traffic regulation measures concerning the vehicles. 8
 b. What are the objectives of traffic sign? List and explain different types of traffic signs. 6
 c. List the longitudinal marking provided on the road surface. Explain any two. 6
 8 a. What is ITS? Discuss the importance of ITS in present scenario. 10
 b. What are the objectives of providing road signs and marking? Explain. 10

UNIT - V

- 9 a. Compare fixed time signal with vehicle actuated signal. 10
 b. Write a note on:
 i) Signal coordination 10
 ii) Street lighting
 10 a. Explain advantages and disadvantages of traffic signals. 10
 b. What is Rotary? Explain the important design elements of a rotary with the help of neat sketches. 10

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