CBCS SCHEME

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17CV561

Fifth Semester B.E. Degree Examination, July/August 2021
Traffic Engineering

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions.***

1 a. What are the different vehicular characteristics which affect road design? Explain. **(10 Marks)**

b. The passenger car weighing 2 tonnes is required to accelerate at a rate of $3m/sec^2$ in the first gear from a speed of 10 Kmph to 20 Kmph. The gradient is 1.5% and road has a black topped surface. The frontal projection area of car is $2.15m^2$. The car tyre has radius of 0.33m. The rear axle gear ratio is 3.82:1 and first gear ratio is 2.78:1. Calculate the engine Horse power needed and speed of the engine. Assume $f = 0.02$, $\lambda = 0.935$, $C_a = 0.39$ and $K = 0.90$. **(10 Marks)**

2 a. Discuss various Urban traffic problems that India is facing. List remedial measures also. **(08 Marks)**

b. Explain the fundamental diagrams of traffic flow. **(06 Marks)**

c. A vehicle travelling at 40 Kmph was stopped within 1.8 seconds after the application of the brakes. Determine the average skid resistance. **(06 Marks)**

3 a. Define the term Spot Speed study. With neat sketch, explain Enoscope method of measuring spot speed study. Mention its advantages and disadvantages. **(10 Marks)**

b. Spot speed studies were carried out at a certain stretch of a highway and the consolidated data collected are given in table Q3(b). Determine the speed limits for installing speed regulations and design speed. **(10 Marks)**

Speed range, Kmph	Frequency	Speed range, Kmph	Frequency
0 – 10	12	50 – 60	255
10 – 20	18	60 – 70	119
20 – 30	68	70 – 80	43
30 – 40	89	80 – 90	33
40 – 50	204	90 – 100	9

Table Q3(b)

4 a. List the objective and uses of Traffic Volume analysis. **(08 Marks)**

b. Estimate the theoretical capacity of a single lane at a stream speed of 50 Kmph. Assume a relationship $S_g = 0.278\ V_t$, where $t = 0.75$ seconds. Take $L = 6m$. Also estimate the capacity for 2 lane system. **(06 Marks)**

c. A vehicle of weight 30 tonnes skids through a distance equal to 50m before colliding with another parked vehicle of weight 3 tonnes. After collision both the vehicles skids through a distance equal to 16m before stopping. Determine the speeds of vehicle after collision. At collision and before collision. Take $f = 0.4$. **(06 Marks)**

5 a. With neat sketches, explain types of Traffic regulatory signs. **(10 Marks)**

b. State the advantages and disadvantages of Traffic signals. **(10 Marks)**

6 a. State the advantages and disadvantages of Traffic rotary intersections. (10 Marks)

b. A right angled intersections of two roads. Road A has four lanes with a total width of 12.0m and Road B has two lanes with a total width of 6.6m. The volume of traffic approaching the intersections during design hour are 900 and 743 PCU/hour on the two approaches of Road A and 278 and 180 PCU/hour on the two approaches of Road B. Design the signal timings as per IRC provisions. (10 Marks)

7 a. What are the major air pollutants due to road traffic? Explain consequences of each. (08 Marks)

b. Explain the measures to control the traffic noise. (06 Marks)

c. What are the major sources of traffic related to noise pollution? Explain. (06 Marks)

8 a. Write various objectives of road accidents studies. (06 Marks)

b. Explain in detail the causes for road accidents. (06 Marks)

c. Explain various design factors of high way lighting. (08 Marks)

9 a. Define Traffic congestion. Explain different methods of traffic restrain. (06 Marks)

b. What are the requirements of congestion pricing system? (06 Marks)

c. Explain the various phases of traffic regulation. (08 Marks)

10 Write short notes on :

a. Intelligent transport system.

b. Travel demand management.

c. Area traffic control.

d. Traffic system management. (20 Marks)

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