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15CV561

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Traffic Engineering

Time: 3 hrs.
Max. Marks: 80

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, can be assumed suitably.

Module-1

1 a. Explain in detail, the various aspects of human vision which affect the road users. **(05 Marks)**
   b. List the various urban traffic and transport problems in India. **(06 Marks)**
   c. Write a note on sustainable approach for land use, transport and model integration. **(05 Marks)**

OR

2 a. Explain PIEV theory, with a neat sketch and standards. **(05 Marks)**
   b. A vehicle is accelerating on a gradient of 1.5 percent, upwards, with a rate of $0.8 m/s^2$, from initial speed of 15 to 25 kmph. Calculate the various resistances encountered by the vehicle and the horse power required, using the following data:
   Mass of the vehicle = 1500kg
   Coefficient for rolling resistance = 0.02
   Frontal area of vehicle = $3.5 m^2$
   Coefficient of air resistance = $0.40 kg/m^3$. **(06 Marks)**
   c. Explain the relationship between various flow parameters, speed, density and volume with neat sketches. **(05 Marks)**

Module-2

3 a. In a moving car observer method of speed and delay on a stretch of a road 1km long, six runs were made each in up and down directions and the average values are given below:
   Calculate the flow in PCU/hour is both directions and also the journey speed and running speed.

Direction	Journey time (min)	Stopped time (min)	Opposing traffic	Overtaking vehicles	Overtaken vehicles
up	1.0	0.10	30	1.5	1.0
down	1.2	0.12	20	1.8	0.8

(06 Marks)

   b. Write a note on application of statistical methods in traffic studies. **(05 Marks)**
   c. With the help of neat sketches, explain the various methods of presenting traffic volume studies data collected. **(05 Marks)**

OR

4 a. Explain condition and collision diagram with neat sketches. **(05 Marks)**
   b. List the various methods of parking studies and explain any one method, in detail. **(05 Marks)**

c. The field data collected through a field study is summarized in table below. Find out: i) Median speed ii) Modal speed iii) Speed limits for traffic regulation iv) Speed limit for geometric design. **(06 Marks)**

Speed range, kmph	Number of vehicles observed
10 – 14.99	3
15 – 19.99	10
20 – 24.99	21
25 – 29.99	31
30 – 34.99	54
35 – 39.99	43
40 – 44.99	21
45 – 49.99	10
50 – 54.99	5
55 – 59.99	2

Module-3

5 a. List and explain any six design elements to be provided in a Rotary Intersection. **(06 Marks)**
b. Explain the role and requirements of a traffic engineer. **(05 Marks)**
c. Explain, in detail the need for Traffic forecasting and various, types of Traffic forecasting, with neat sketches. **(05 Marks)**

OR

6 a. The saturation flow and normal traffic volumes on North, South, East and West approaches of a four legged intersection are given below:

	North	South	East	West
Normal traffic volume PCU/hr	500	400	300	250
Saturation flow, in PCU/hr	1500	1200	1200	1250

Assume inter-green period as 8 seconds between each phase and red or red-amber shows simultaneously and they lost time delay due to starting on each phase is 2 seconds. Determine the optimum cycle time for a two phase signal and distribution of green time on NS and EW approaches by using Webster's method. **(06 Marks)**
b. Explain the classification of Intersections at grade, in detail. **(05 Marks)**
c. Explain the various functions of i) Traffic signs ii) Pavement or Road markings. **(05 Marks)**

Module-4

7 a. List and explain the various causes of road accidents. **(05 Marks)**
b. Explain the various approaches or measures to be taken to reduce the noise pollution. **(06 Marks)**
c. Explain the various measures to be taken for promotion of non-motorized transport. **(05 Marks)**

OR

8 a. List and explain the various detrimental effects of traffic on the environments. **(05 Marks)**
b. Explain various factors to be considered in the design of road lighting. **(05 Marks)**
c. Explain the various measures to be taken to reduce the rate of accidents. **(06 Marks)**

Module-5

9 a. Explain the various traffic segregation techniques, in detail. **(05 Marks)**
b. Explain the direct and indirect methods of traffic restraint, in detail. **(05 Marks)**
c. Explain the role of intelligent transport system in management, enforcement of traffic. **(06 Marks)**

OR

10 a. Write a note on Area Traffic Control, in detail. **(06 Marks)**
b. What are the various Traffic regulations required for safe Traffic operation. **(05 Marks)**
c. Explain the various effects of congestion related to Traffic. **(05 Marks)**

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