USN | | | | | | | | | | 10CV667

Sixth Semester B.E. Degree Examination, June/July 2018
Traffic Engineering

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Define traffic engineering. What are the objectives of traffic engineering? Also explain the scope of traffic engineering. **(10 Marks)**
   b. Discuss the road user characteristics in detail. **(10 Marks)**

2 a. What are the objectives of traffic volume studies? **(05 Marks)**
   b. A vehicle was stopped in 1.8secs by fully applying the brakes and the skid marks measured 9.0m. Determine the average skid resistance. **(05 Marks)**
   c. The table below summarises the field data obtained for spot speeds.

Speed Mid Class (Kmph)	25	35	45	55	65	75	85	95	105	115
No. of vehicles observed	7	20	35	52	63	40	27	13	6	3

   Plot the analysed data and obtain the following :
   i)   Speed limit for traffic regulation
   ii) Speed for geometric design. **(10 Marks)**

3 a. Explain the uses of i) Spot speed studies   ii) Speed and delay studies. **(06 Marks)**
   b. Discuss the purpose of parking studies. Explain the various aspects to be investigated during parking studies. **(08 Marks)**
   c. List the applications of O and D studies. **(06 Marks)**

4 a. Define PCU. List the factors which affect the PCU values of different vehicle classes. **(06 Marks)**
   b. Explain the various preventive measures to reduce accidents. **(06 Marks)**
   c. A vehicle of weight 25 tonnes skids through a distance equal to 50m, before colliding with another parked vehicle of weight 2.5 tonnes. After collision both the vehicles skid through a distance equal to 13m before stopping if the coefficient of friction is 0.5, compute
   i)   Speed after collision
   ii) Speed at collision
   iii) Speed before collision. **(08 Marks)**

PART – B

5 a. Describe the Green – shield model of traffic flow. **(06 Marks)**
   b. The data given below shows the occupancy of parking spaces in a parking lot consisting of 50 spaces. The count was taken at 15 min intervals during the 4 hours on 6 week days. Find whether the number of vacant spaces during any count follows a Poisson's distribution.

Occupancy of parking spaces	50	49	48	47	46	45	44	43	42	41	≤ 40
Frequency	6	15	21	20	15	10	5	2	1	1	0

   (10 Marks)
   c. Explain Goodness of fit test. **(04 Marks)**

6 a. The spot speeds at a particular location are normally distributed with a mean of 51.7kmph and a standard deviation of 8.3kmph. What is the probability that

     i) Speed exceeds 65 kmph

     ii) Speed lies between 40 and 70 kmph.

    The values from normal distribution tables are

    ϕ (1.6) = 0.952, ϕ (2.21) = 0.9864

    ϕ (1.41) = 0.9207, ϕ (Z) = 0.85 for which Z = 1.04   **(10 Marks)**

  b. Explain briefly: i) Phases of traffic regulation   ii) Regulatory signs.   **(10 Marks)**

7 a. List the advantages and disadvantages of traffic signals.   **(06 Marks)**

  b. The average normal flow on cross – roads A and B during design period are 500 and 300 PCU per hour. The saturation flow values on these roads are estimated as 1300 and 1000 PCU per hour respectively. The all red time required for pedestrian crossing is 13 secs. Design two phase traffic signal by Webster's method.   **(10 Marks)**

  c. Design a street lighting system for the following conditions. Lane width = 20m, mounting height = 7m, Lamp size = 8000 lumen, Luminance type = II. Assume coefficient of utilization as 0.44 and maintenance factor as 0.8. Calculate the spacing between lighting units to produce average Lux – 6.0   **(04 Marks)**

8 a. Define ITS. What are its applications in traffic engineering?   **(06 Marks)**

  b. Enumerate the design factors and the advantages of a rotary.   **(08 Marks)**

  c. Explain the various design factors in road lighting.   **(06 Marks)**

* * * * *