Reg. No. : | | | | | | | | | | |

Question Paper Code: 59012

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Civil Engineering

15UCE905 - TRAFFIC ENGINEERING AND MANAGEMENT

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The car following theory may be expressed in terms of the equation

   (a) Response = Speed x Time (b) Response = Sensitivity x Speed
   (c) Response = Speed x Stimulus (d) Response = Sensitivity x Stimulus

2. The traffic intensity is

   (a) $\lambda/\mu > 1$ (b) $\lambda/\mu > 2$ (c) $\lambda/\mu < 1$ (d) $\lambda/\mu = 1$

3. Unwarranted signal installations tend to encourage the _____of signal indications.

   (a) free flow (b) disobedience (c) Peak traffic (d) Congestion

4. FLEXIPROG system is a

   (a) Flexible program (b) Flexible possible
   (c) Flexible Progressive (d) Traffic analysis

5. The survey consists of issuing a questionnaires or log sheets to the taxi drivers is called

   (a) Taxi surveys (b) Post-card questionnaire
   (c) Tags on vehicles (d) Commercial surveys

6. Rotary intersection is a specialized form of at _____ laid out for movement of traffic in one direction round a central island.

   (a) T intersection (b) Grate intersections
   (c) Y intersection (d) Single carriage way

7. A diagram which is a schematic representation of the all the accidents occurring at a a particular location is called

(a) Tree diagram (b) Rear end (c) Collision (d) Head to head

8. The break reaction time for a driver is

(a) 3 seconds (b) 1.5 seconds (c) 2.5 seconds (d) 3.5 seconds

9. The diversion of the right – turning traffic beyond by the junction is known as

(a) Q turn (b) T turn (c) G turn (d) S turn

10. "PCU" means

(a) Passenger Car Units (b) Particular Car Units
(c) Passenger Car Utility (d) Passenger Capacity Units

PART - B (5 x 2 = 10 Marks)

11. Reproduce any two assumptions made in a simple queuing approach as applied to traffic flow.

12. Mention any two advantages of traffic signals.

13. List out the conditions that are to be satisfied while analyzing multiple linear regress.

14. In what way does one-way traffic helps in reducing accidents?

15. Mention some of the traffic management measures.

PART - C (5 x 16 = 80 Marks)

16. (a) Derive an equation for car following theory. (16)

Or

(b) (i) There is a single toll booth in operation at a motorway where motorists are charged before being allowed to cross a bridge. The booth can handle 800 V.P.H. and the service times may be considered exponential. The peak flow is 720 V.P.H., the vehicle arrivals being random. Calculate

1) the average number of vehicles in the system;

2) the average time a vehicle is in the system;

3) the average time a vehicle is in the queue;

4) the chances of there being more than 4 vehicles in the system;

5) the percentage of time a toll booth operator is free;

6) the probability that there is no vehicle in the system;

7) The probability that the number of vehicles in the system is three. (10)

(ii) Mention the advantages of simulation techniques in traffic. (6)

17. (a) (i) What are the types of signals? Explain the types in detail. (8)

(ii) An intersection controlled by traffic signals is formed by two roads running north to south and east to west. There is a heavy turning movement of 500 vehicles per hour from south to east. The flow from north to south is 800 vehicles per hour through an approach width at stop line of 8 m. The cycle time is 70 seconds and the effective green time for the flow from the north is 32 seconds. The effective right-turning saturation flow is 450 vehicles per hour for an opposing flow of 800 vehicles per hour, related to a minimum head-way of two and a half seconds for the right-turning stream. Calculate the early-cut-off period required to allow for the right-turning movement. (8)

Or

(b) (i) Explain in detail about the need for co-ordination of signals and give brief information about the types of co-ordinated signal system. (10)

(ii) Discuss clearly about the traffic control methods. (6)

18. (a) Enumerate in detail about the different methods of photography in traffic. (16)

Or

(b) (i) Explain in detail about rotary intersections with neat sketch. (10)

(ii) Mention the guidelines for selecting a rotary type of intersections. (6)

19. (a) (i) Enumerate the alternative methodologies for accident costing. (8)

(ii) What are the human factors governing road user behavior? (8)

Or

(b) Bring out the factors that cause accidents and skid resistance. (16)

20. (a) (i) Explain about the methods of traffic management measures. (12)

(ii) Brief note on importance of capacity in traffic studies. (4)

Or

(b) (i) Discuss the level of service concept. (8)

(ii) Write in detail about factors affecting capacity studies. (8)