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Reg. No. :

B B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Open elective

Computer Science and Engineering

19UCE977- Road Safety

(Common to ECE, EEE, EIE, Mechanical, IT, Chemical, Agri, Bio Medical)

(Regulation 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. $$\sum_r p(r) = 1 \quad and \quad \int_{-\infty}^{\infty} f(x)dx = 1$$ CO1-A

   is denoting a ……….

   (a) skewness   (b) Probability density function

   (c) cumulative function   (d) kurtosis

2. The diagram which provides accident data such as crash type, severity,   CO2-A
   speed, light *conditions*, and road *conditions* are

   (a) Condition diagram   (b) Collision diagram

   (c) FIR   (d) Investigation certificate

3. The popular traffic control device is   CO3-U

   (a) Road Marking   (b) Speed breakers   (c) Traffic signals   (d) Rumbled strips

4. Grade separators helps in   CO4-U

   (a) Saving travel time   (b) nullifying the conflicts

   (c) avoiding conflicts and saving travel time   (d) reduce travel distance

5. ……………….is the maximum hourly rate at which persons or vehicles   CO5-U
   can be reasonably expected to traverse a point

   (a) Highway Capacity   (b) Concentration   (c) Density   (d) Highway LOS

PART – B (5 x 3= 15 Marks)

6. Comment on the Influence of traffic speed on highway capacity.   CO1- App

7. Justify the use of chi-square distribution in traffic analysis with a case study   CO2- App

8. Under what conditions, Regulatory roadsigns are installed in an urban intersection? Justify with fundamental requirements for installing a traffic control device.   CO3- Ana

9. Suggest suitable strategies to modify an urban transport mode into sustainable mode?   CO4- App

10. Predict the outcomes of a road safety audit conducted on a Madurai - Aruppukottai highway, based on the flow of traffic on this stretch.   CO5- Ana

PART – C (5 x 16= 80Marks)

11. (a) Highlight the problems created due to the steady state conditions of traffic   CO1- App   (16)

Or

(b) Under what conditions, queuing theory concepts are applied in traffic engineering.   CO2- App   (16)

12. (a) Create a basic mathematical model showing the correlation between the vehicle characteristics and road user characteristics (Choose any 4 parameters).   CO2- App   (16)

Or

(b) Design a parking facility to accommodate 500 cars at the city center of Madurai adopting the 30deg, 45deg parking pattern. Adopt the fundamentals of parking standards.   CO2- App   (16)

13. (a) Create a static model showing the road cross sectional elements showing super elevation, camber, horizontal curve and gradient to demonstrate their vulnerability for accidents, with a case study of Madurai/Chennai/any other city   CO3- Ana   (16)

Or

(b) Suggest suitable strategies to change the habit of traffic violations among the youngsters on Road.   CO3- Ana   (16)

14. (a) Analyse the role and scope of grade separated intersections in a growing city such as Madurai and Trichy.   CO4- App   (16)

Or

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(b) Correlate between Occupancy (no. of persons in a vehicle) and Probability of Accident occurrence by analyzing the traffic conditions on the NH roads   CO4- App   (16)

15. (a) Design a questionnaire for a road safety audit at selected locations of NH43 (Valayankulam to Aruppukottai) to analyze the performance standards of the chosen road stretches.   CO5- App   (16)

Or

(b) Expedite the scope of increasing the capacity of a highway without compromising the interests of slow-moving vehicles. Present a case study in from native city.   CO5- App   (16)

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