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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**SUMMER TERM END TERM EXAMINATION- AUGUST 2024**

**Summer Term:** 2023-24

**Course Code**: CIV 2026

**Course Name**: Traffic Engineering

**Program & Sem**: B.tech & 7th Sem

**Date**: 05-08-2024

**Time**: 09:30 AM – 12:30 PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*
3. *Scientific and Non-programmable Calculators are permitted.*

**PART A**

**ANSWER ANY 4 QUESTIONS. (4Qx 5M= 20M)**

1. What is traffic engineering and why is it important? (C.O.No.1) [Knowledge]

2. A multilane highway lane is observed to have a traffic congestion with an average spacing of 80m and an average headway of 4 sec. Estimate the rate of flow, density and speed of the traffic in that lane. (C.O.No.2) [Knowledge]

3. List any 5 Traffic study surveys that are carried out to analyze the traffic. Also write any two uses of any one of these surveys. (C.O.No.3) [Knowledge]

4. Write any five applications of Intelligent Transportation System (ITS). (C.O.No.4) [Knowledge]

5. What is the objective of including traffic calming measures? Also mention few Traffic Calming measures used on roads. (C.O.No.4) [Knowledge]

**Part B**

**ANSWER ANY 5 QUESTIONS. (5Qx10M=50M)**

6. Road users play an important role in studying traffic engineering. They take up various roles like drivers, pedestrians, cycles etc. and assess the conditions in their own unique way. Explain the physical and mental characteristics of a Road user. (C.O.No.1) [Comprehension]

7. There are 3 major models that come under Single Regime Traffic Stream. Brief on all the three models along with formulas and also calculate the Maximum flow on the stretch if the Speed and density are related as V = 100 – 0.5K, where V =kmph and K= vehicles/km. Use the Greenshield’s model. (C.O.No.2) [Comprehension]

8. In Origin and Destination studies, the routes taken by various vehicles are observed by collecting data using various techniques. Explain any five methods of performing the Origin and Destination studies and also write the advantages and disadvantages of each method.

(C.O.No.3) [Comprehension]

9. A vehicle parked in a wrong manner can lead to traffic congestion, accidents and also environmental pollution. In the above context, explain the different types of On-street parking systems with neat diagrams. (C.O.No.3) [Comprehension]

10. In Automatic counting methods, vehicles are counted automatically without any human involvement. It provides the means of gathering large amounts of traffic data. Explain the different methods using which the automatic counts are recorded. According to you, what are the factors affecting vehicle counting? (C.O.No.3) [Comprehension]

11. Traffic signals are designed to keep traffic flowing in an orderly and efficient manner while helping to ensure both driver and pedestrian safety as they navigate through intersections. Explain the different types of Traffic signals. Mention the advantages and disadvantages for each.

(C.O.No.4) [Comprehension]

12. Table below gives the traffic from the four approaches, traversing the intersection. Show the proportion of weaving and non-weaving traffic approaching a rotary using a neat diagram and calculate only pES, pNE, pSW and pWN.

|  |  |  |  |
| --- | --- | --- | --- |
| **Approach** | **Left Turn** | **Straight** | **Right Turn** |
| North | 300 | 500 | 400 |
| South | 300 | 350 | 420 |
| East | 250 | 400 | 500 |
| West | 300 | 400 | 350 |

(C.O.No.4) [Comprehension]

**Part C**

**ANSWER ANY 2 QUESTIONS. (2Qx15M=30M)**

13. Traffic studies are carried out to analyze the traffic characteristics that helps in deciding the geometric design features for safe and efficient traffic movement. There are various traffic survey studies that are conducted such as Speed studies, Spot speed study, Speed and delay studies, O & D studies, Parking study, Accident studies and many more. From the above given list, describe any three traffic survey studies in detail along with the methods using which these surveys are conducted. (C.O.No.3) [Application]

14. The width of approaches for a Rotary intersection is 12 m. The entry and exit width of the rotary is 10m. Table below gives the traffic from the four approaches, traversing the intersection. Find the Capacity of the Rotary. (C.O.No. 4) [Application]

|  |  |  |  |
| --- | --- | --- | --- |
| Approach | Left Turn | Straight | Right Turn |
| North | 450 | 500 | 250 |
| South | 300 | 420 | 400 |
| East | 250 | 360 | 500 |
| West | 350 | 450 | 320 |

15. Speed and delay studies give information on running speed, fluctuations in speed and delay between two stations of a road spaced far apart. There are various methods used to carry out speed and delay survey. Explain each of these methods in detail. (iii) Calculate the Maximum flow on the stretch if the Speed and density are related as V = 300 – 0.3K, where V =kmph and K= vehicles/km. (C.O.No.3) [Application]