

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019**

**Course Code: CE366**  
**Course Name: TRAFFIC ENGINEERING AND MANAGEMENT**

Max. Marks: 100

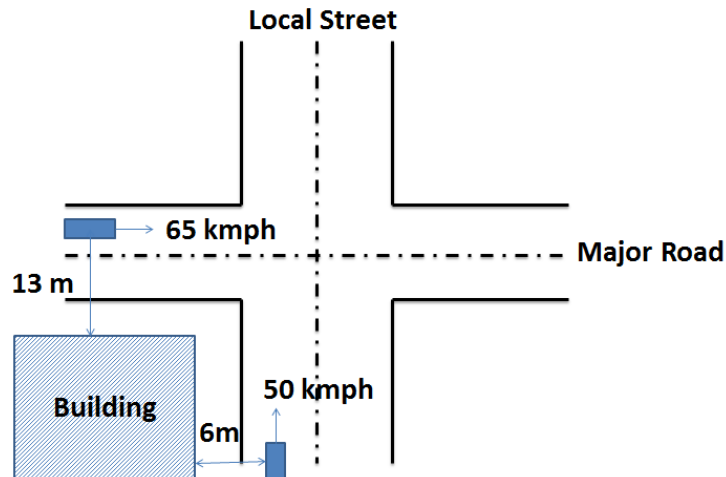
Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- 1 a) A major road with design speed of 65 km/h meets with a local street of speed limit 50 km/h as shown in **Figure 1**. Assuming a reaction time of 2.5sec on a level ground with  $f=0.35$ , analyse whether the intersection is safe or not. (10)



**Figure 1**

- b) Write short notes on following traffic management measures: (5)
- a) Tidal flow operation b) Exclusive bus
- 2 a) Show the conflict points at the intersection of the following types: (10)
- (a) Cross-roads, both two-way  
 (b) Cross-roads, one-way  
 (c) T-intersection, both two-way  
 (d) Y-intersection, one one-way
- b) What is the need for speed regulation and discuss the various methods of enforcing speed regulations. (5)
- 3 a) Explain Intelligent transportation System and discuss how the different functional areas of ITS helps in traffic management. (7)
- b) What is the significance of traffic regulations in traffic engineering? (8)

Discuss (a) Regulations of vehicle (b) Regulations concerning the driver

### PART B

*Answer any two full questions, each carries 15 marks.*

- 4 a) A fixed time signal is to be provided at an intersection having N-S and E-W flows. The design hour flows and the saturation flow from the various arms are given in the table. Determine the number of phases and calculate the optimum cycle length based on Webster's equation and find the corresponding green times. Total loss per phase is 5 sec. and yellow interval is 2 sec. Sketch the timing diagrams for each phase (10)

	<b>N Bound</b>	<b>S Bound</b>	<b>E Bound</b>	<b>W Bound</b>
Volume (PCU/h)	1300	900	1000	600
Saturation Flow (PCU/h)	3500	3000	2500	2300

- b) Define the terms basic capacity, possible capacity and practical capacity and its importance in traffic engineering. (5)
- 5 a) Explain the warrants for traffic signals (5)
- b) Explain the various types of co-ordinated signal system (5)
- c) What is traffic rotary? What are its advantages and limitations in particular reference to traffic conditions in Kerala (5)
- 6 a) Explain grade-separated intersections and discuss the advantages and limitations (5)
- b) Explain the factors affecting level of service of a multilane highway (5)
- c) Define passenger car units. What are the factors on which PCU values depend? (5)

### PART C

*Answer any two full questions, each carries 20 marks.*

- 7 a) The maximum capacity of a 2 lane road in one direction is 2000 vehicle/hour. The actual flow of traffic during a normal day under steady state condition is 1500 vehicles/ hour. The flow is brought to halt when traffic signal turns red and results in the formation of queue. When vehicles are stationary in a jamming condition, the average length occupied by a vehicle is 6.25m. Find the time in seconds which elapses from the moment the signal turns red until the stationary queue reaches another intersection 250m from the signal. (10)
- b) Explain car following theory and Queuing theory in detail (10)
- 8 a) Explain the fundamental diagrams of traffic flow and derive the expression for determining the maximum traffic flow (10)

- b) Explain (a) Condition Diagram (b) Collision Diagram, and its use in accident studies (10)
- 9 a) Explain the basic diagrams of traffic flow in a bottleneck condition when one lane of a four lane divided carriage way is closed for repairs (10)
- (a) Flow is less than capacity of bottleneck
  - (b) Traffic flow is equal to bottleneck capacity
  - (c) Flow greater than the capacity of bottleneck
- b) What are the causes of road accidents and discuss how each of these factors leads to accident and its preventive measures (10)

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