

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018**

**Course Code: CE 366**  
**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) Explain the traffic management measures adopted for restricting the turning movements. | (5)   |
|   | b) What is tidal flow operation in traffic management system?                             | (5)   |
|   | c) Write short notes on traffic calming measures.   | (5)   |
| 2 | a) Explain how the points of traffic conflict are reduced by introducing one way streets. | (5)   |
|   | b) Write short notes on traffic segregation methods.                                      | (5)   |
|   | c) What are the applications of ITS in traffic engineering?                               | (5)   |
| 3 | a) Write short notes on Motor Vehicle Act.  | (5)   |
|   | b) Explain the different aspects covered in the regulation of vehicles and drivers        | (10)  |

**PART B**

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

- |   |   |      |
|---|---|------|
| 4 | a) Differentiate between basic, practical and possible capacity of highways.  | (5)  |
|   | b) Explain the various Level of Services as per HCM and what are the factors affecting the capacity and LOS.                            | (10) |
| 5 | a) Differentiate between at grade intersections and grade separated intersections with sketches.  | (5)  |
|   | b) Explain with a neat diagram, the various design elements of a rotary type intersections. How the capacity of a rotary is determined? | (10) |
| 6 | a) Write short notes on Signal Coordination.  | (5)  |
|   | b) Explain the Webster's approach for the design of a fixed time traffic signal.  | (10) |

**(Turn over)**

**PART C**

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

- 7 a) What are the significant uses of accident data? (5)
- b) Explain with neat sketches the collision and condition diagrams in accident analysis. (5)
- c) Explain the influence of various factors on road accidents. (10)
- 8 a) Explain the fundamental diagrams of traffic flow and derive a relationship between flow, speed and density. (10)
- b) On a two-lane carriage way, The maximum traffic flow per lane on the un obstructed carriage way is 2500 veh/hr and when stationary, vehicles are spaced at an average distance headway of 8m. Assuming a linear relationship between speed and density, calculate the free flow speed of the carriageway. (5)
- c) Explain car following theory. Discuss any 2 models. (5)
- 9 a) Explain in detail the basic concepts of Lighthill and Whitham's theory. (10)
- b) Explain various methods of collecting accident data. How the accident data is expressed? (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 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) | Explain the techniques of travel demand management.       | (10) |
|   |    | b) Explain the various measures for traffic calming.      | (5)  |
| 2 | a) | Define tidal flow operation.                              | (3)  |
|   | b) | Explain the methods of implementing tidal flow operation. | (2)  |
|   | c) | Explain the various applications of ITS.                  | (10) |
| 3 | a) | Explain the various regulations concerning the driver.    | (10) |
|   | b) | Write short notes on Motor vehicle Act.                   | (5)  |

**PART B**

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

- |   |    |   |      |
|---|----|---|------|
| 4 | a) | Define basic capacity, possible capacity and practical capacity.  | (5)  |
|   | b) | With neat sketches illustrate the concept of LOS.   | (10) |
| 5 | a) | List the factors that influence the capacity of signalised intersection.  | (10) |
|   | b) | Explain the procedure for computation of capacity of rotary intersection using Wardrops formula.  | (5)  |
| 6 | a) | A three-phase traffic signal is to be installed at a right angled crossing of two city streets. The site is average and the approaches are 12m wide between kerbs. The approaches are straight and level and parking is prohibited on them. One of the phases is to be pedestrian only phase occurring at the end of each cycle. Starting delay maybe taken as 2seconds. An all-red period of 4seconds is to be provided after each vehicle phase to allow clearance of right turning vehicles left over in the crossing. The design hour traffic volumes in PCU/hour are given in the following time | (10) |

From	N			E			S			W		
To	E	S	W	S	W	N	W	N	E	N	E	S
PCU/hr	40	800	70	60	500	50	60	660	60	70	680	60

Calculate the optimum cycle time for fixed time installation. Sketch the phasing diagram for each phase. Draw a diagram showing the timings for all three aspects of a complete cycle. Make suitable assumptions for amber and pedestrian interval.

- b) Explain the warrants for installation of traffic signals (5)

### PART C

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

- 7 a) Explain the roadway factors that influences road accidents. (12)  
 b) With neat sketches differentiate between collision and condition diagrams (8)
- 8 a) Describe the measures that can be adopted to prevent accidents (12)  
 b) List the assumptions made in simple queuing approach as applied to traffic flow (8)
- 9 a) A toll booth at the entrance to bridge can handle 120 veh/hour, the time to process a vehicle being exponentially distributed. The flow is 90veh/hour with a Poissonian arrival pattern. Determine: (i) the average number of vehicles in the system (ii) the length of the queue (iii) the average time spent by the vehicle in the system (iv) average time spent by the vehicle in the queue. (8)  
 b) With neat sketches illustrate the fundamental diagrams of traffic flow. (12)

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**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

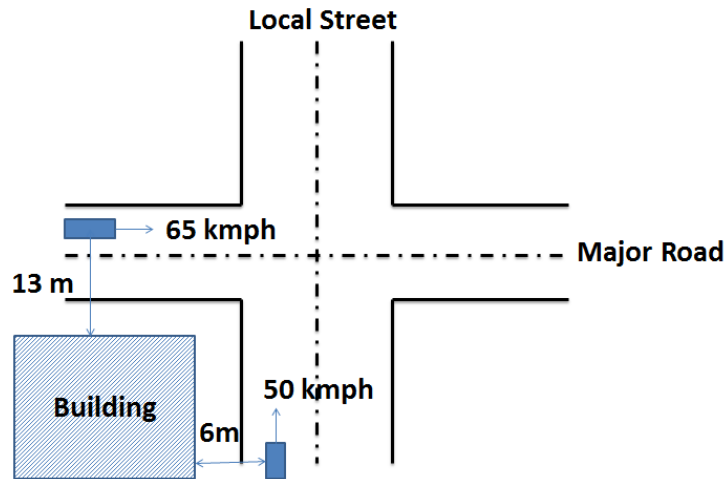
Duration: 3 Hours

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Sixth semester B.Tech degree examinations (S), September 2020

**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) Explain the significance of restriction on turning movements in Traffic System Management? | (10) |
|   | b) Explain the factors to be considered for the speed limits.                                 | (5)  |
| 2 | a) What are the different calming measures in traffic engineering?                            | (10) |
|   | b) Explain the applications of ITS.   | (5)  |
| 3 | a) Describe the parking regulations in the Traffic management.                                | (10) |
|   | b) Describe the importance of traffic enforcement and punishments in regulation of traffic?   | (5)  |

**PART B**

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

- |   |  |      |
|---|--|------|
| 4 | a) Explain the LOS concept in HCM manual?  | (12) |
|   | b) Define the terms: a) Interval Cycle length c) Phase of a signal   | (3)  |
| 5 | a) Explain the advantages and limitations of rotary intersection?  | (10) |
|   | b) Explain the advantages and disadvantages of traffic signals?  | (5)  |
| 6 | a) A fixed time 2 phase signal is to be provided at an intersection having a North – South and a East – West road where only straight ahead traffic is permitted. The design hour flows from the various arms and the saturation flows for these arms are given below. Calculate the optimum cycle time and green times for the minimum overall delay. | (10) |

	North	South	East	West
Design hour flow (q) in PCU/hour	800	300	700	1000
Saturation flow (s) in PCU/hour	2200	2000	3000	3000

Assume the value of amber period is 2 seconds and the time lost per phase due to starting delays as 2 seconds. Also Sketch the timing diagram for each phase.

- b) Define PCU and explain the factors affecting it? (5)

**PART C**

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

- 7 a) What are the applications of Queuing theory in traffic engineering? (8)  
b) What the factors determining skid resistance? (6)  
c) Define the terms: i) Road Accident ii) Motor vehicle iii) Fatal accident (6)
- 8 a) A road consists of 4 lanes, 2 in each direction. The maximum capacity of the 2 lanes in one direction is 2000 vehicles/hour. When vehicles are stationary in a jamming condition, the average length occupied by the vehicle is 6.25 m. During a period of observation, the actual volume of traffic in one direction is steady at the rate of 1100 vehicle/hour. This flow is brought to a halt when a traffic signal turns red and a queue forms. Assume linear relationship between speed and concentration. Determine the speed of shock waves generated. (10)  
b) How traffic management measures can reduce the accident rate in the country? (10)
- 9 a) Explain the influence of vehicle and driver on road accidents? (12)  
b) The off-peak traffic flow arriving at random at toll booth facility is 100 V.P.H and the peak flow is 180 V.P.H. The service rate, exponentially distributed at the booth is 3.4 per minute. What is the average number of customers in the queue for each flow? (8)

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