

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E –IIst SEMESTER–EXAMINATION – JULY- 2012****Subject code: 1721306****Date: 10/07/2012****Subject Name: Transportation Facility Design****Time: 10:30 am – 13:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) What are the functions of the Airport Passenger Terminal ? State Principal user classes of the Airport Passenger Terminal. **07**

(b) Explain, with a flow-chart the facilities required at the Airport, Passenger Terminal. **07**

Q.2 (a) Explain engineering concepts for horizontal and vertical alignment in design of Highway (inter-urban) and urban streets. **07**

(b) Explain the hierarchy of highway system with respect to inter urban and urban contexts along with their functions. **07**

OR

(b) Explain, with a flow-chart, the passenger and baggage flow at International Airport Terminal. **07**

Q.3 (a) Sketch the basic forms of At-grade intersections. Explain basic principles of design for At-grade intersections. **07**

(b) Explain, with sketches, different types of grade-separated intersections along with their suitability. **07**

OR

Q.3 (a) Sketch Rotary intersection showing various elements and state advantages and disadvantages of rotary intersection, along with general guidelines for selecting a rotary type of intersection. **07**

(b) Traffic flow at an urban intersection in the design year are given below : **07**

Approach Rd.	Left Turning			Straight Ahead			Right Turning		
	Cars	CV _s *	2W*	Cars	CV _s *	2W*	Cars	CV _s *	2W*
North	200	50	100	250	100	150	150	50	80
East	180	60	80	220	50	120	200	40	120
South	250	80	100	150	50	90	160	70	90
West	220	50	120	180	60	100	250	60	100

* CV_s = Commercial vehicles (PCU= 2.8)

** 2W = Motorized 2 – Wheelers (PCU = 0.75)

The roads intersect at right angles and have a carriageway width of 15m. Design a rotary intersection making suitable assumptions.

Q.4 (a) Explain the design criteria for separate cycle tracks (non-motorized transport) and Pedestrians. **07**

- (b) A fixed time 2-phase signal is to be provided at an intersection having a North-South and an East-West road where only straight – ahead traffic is permitted. The design – hour flows from various arms and the saturation flows for these arms are given in the following table : **07**

	North	South	East	West
Design hour (q) flow (PCU _s /hr)	800	400	750	600
Saturation flow(s) (PCU _s /hr)	2400	2000	3000	3000

Calculate the optimum cycle time and green times for the minimum overall delay. The inter-green time should be the minimum necessary for efficient operation. The time lost per phase due to starting delays can be assumed to be 2 seconds. The value of the amber period is 2 second.

OR

- Q.4 (a)** Explain, the warrants (criteria) for deciding on signal installation at a particular intersection. **07**
- Q.4 (b)** What is the need for coordinated control of signals at various intersections on main traffic route. Explain various types of coordinated signal system. **07**
- Q.5 (a)** Explain “stops”, “stations” and “terminals” with respect to urban transit. **07**
- (b)** Explain Inland Port Facilities Planning for export-import business. Also, explain Inland port Terminal services. **07**

OR

- Q.5 (a)** State the requirements of good port for waterways. Classify harbours. Distinguish between natural and artificial harbours. **07**
- (b)** Explain various services for shipping terminals as part of port facilities. **07**
