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B.E. / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS

NOVEMBER / DECEMBER, 2012

CIVIL ENGINEERING BRANCH

SEVENTH SEMESTER – (REGULATIONS 2008)

25

CE 9040 – TRAFFIC ENGINEERING AND MANAGEMENT

(Graph Sheets have to be supplied on demand)

Time: 3 Hours

Max. Marks: 100

Instructions

- 1. Answer ALL Questions**
- 2. Draw neat sketches wherever required**

PART – A (10 x 2 = 20 Marks)

1. Distinguish between 'Time Mean Speed' and 'Space Mean Speed'.
2. State any two vehicular characteristics, which affect road designs.
3. What do you understand by the Average Daily Traffic and the 85th percentile speed?
4. Existing peak hour volume of traffic on an urban arterial is 14,000 PCU. Forecast the volume by 2020. Assume the growth rate of vehicles as 10 percent.
5. Specify any four guidelines by the Indian Roads Congress (IRC) for the selection of a traffic rotary.
6. State the basic principle of traffic control and management.
7. Enumerate any four components causing road accidents.
8. List any four alternate methodologies for accident costing and state the concept of any one method.
9. How do you think that the building permit system is a tool for traffic control?
10. What are exclusive traffic lanes? What is its advantage?

PART – B (5 x 16 = 80 Marks)

11. i) State functions and locations of any one urban and rural roads each. (4)
- ii) Draw typical cross sections of an urban arterial and an Express way and indicate standards stipulated by the (IRC) for these roads. (6)
- iii) Draw fundamental diagrams of traffic flow for the speed and the flow and the flow and the density and interpret the characteristics of the flow. (6)

12.a. Explain the method of conduct, analyses and application of the following traffic surveys.

- i) Volume at intersections
- ii) Origin and Destination by road side interviews
- iii) Parking

(Or)

b.i) The following data were obtained from the spot speed studies

Speed Range Kmph	No. of vehicles observed	Speed Range Kmph	No. of vehicles observed
< 5	45	30 - 35	430
5 - 10	30	35 - 40	290
10 - 15	375	40 - 50	110
15 - 20	500	50 - 60	25
20 - 25	680	60 - 70	8
25 - 30	525	> 70	2

Determine

- Speed limit for regulation
- Speed to check geometric design elements
- Lower speed group causing congestion and
- Modal Speed

ii) Parking survey data by the license plate method is shown in the table below. Draw the accumulation curve and find out the average parking load, average duration, parking turnover and parking index.

Bay	Time			
	0 - 15	15 - 30	30 - 45	45 - 60
1	6541	3189	-	8765
2	5491	5491	5491	5491
3	3743	3645	3645	3645
4	1473	1473	8579	5284
5	4881	4881	-	4957
6	-	7537	-	3987
7	-	5984	5984	5984
8	2398	2398	2398	-
9	3567	3567	8990	1284
10	1237	-	9872	9872
11	3121	3121	2123	8774
12	8765	8766	8777	8888

13.a.i) Illustrate the following regulatory techniques with neat sketches.

- One way street
 - Reversible street
- (6)

ii) A rotary is proposed in a rural area at a location where two four lane divided roads meet each other. The peak hour traffic flow is as follows:

Name of the Arm feeding traffic to the intersection	Traffic Flow in PCUs / hour		
	Left	Straight	Right
North	450	650	250
East	550	490	300
South	475	400	390
West	390	500	450

Design a rotary for the intersection.

Assume the width of the carriageway at entry and exit as 8m and the weaving length four times the weaving width. (10)

(Or)

b.i) Explain warrants for minimum vehicular and minimum pedestrian volumes for signal design. (6)

ii) A traffic signal is to be installed at an intersection where two six lane divided roads intersect at right angles. The peak hour traffic flow observed is as follows:

Name of the Arm feeding traffic to the intersection	Traffic Flow in PCUs / hour		
	Left	Straight	Right
North	360	706	306
East	411	625	392
South	347	730	284
West	426	597	421

Design the phasing pattern and green time for each phase. (10)

14.a. Discuss the following with reference to road safety as stipulated by the IRC.

- i) Data collected for accident investigation (5)
- ii) Condition and collision diagram in accident investigation (6)
- iii) Measures to prevent accidents due to engineering causes (5)

(Or)

b.i) Explain any five environmental hazards due to traffic and suggest abatement measures. (10)

ii) Illustrate with neat sketches 'street lighting layouts' at the following locations:

- A Cross Intersection
 - A 'T' Junction
 - A Rotary Intersection
- (6)

15.a. Compare concepts of Traffic System Management and Traffic Demand Management. Do you think that the traffic management of Chennai City has evenly and effectively applied these two components? Substantiate your answer.

(Or)

15.b. Write short notes on the following with reference to traffic management.

- i) Area Traffic Management System
- ii) Road pricing and non-road pricing options, two each
- iii) Promotion of public transport
- iv) Tidal flow operation and its remedies.