

Code No: C8703

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech I - Semester Examinations, March/April -2011

TRAFFIC ENGINEERING
(HIGHWAY ENGINEERING)

Time: 3hours

Max. Marks: 60

Answer any five questions
All questions carry equal marks

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1. a) Derive the fundamental relationship of traffic parameters viz., flow, density and speed?
b) Two sets of vehicles are timed over a kilometer, and flows are also recorded. In the first set, four vehicles take 60, 64, 70 and 75 seconds when the flow is 1500 veh/h. In the second set, four vehicles take 75, 79, 85 and 87 seconds when the flow is 2700 veh/h. these values are times over space. Find (i) space mean speeds for each set (ii) concentrations (iii) Capacity of the facility. [12]
2. a) Explain how you arrive at the annual average daily traffic from a 7 day 24 hour traffic count. What is Design hourly Volume (DHV)? How DHV is obtained for planning purposes?
b) List out various methods of conducting spot speed studies. What are the drawbacks of direct timing method of speed survey? How do you eliminate these drawbacks in enoscope method? [12]
3. a) Explain any one methodology of determining optimum offsets for a corridor with two way movements.
b) Explain the following (signal coordination) system on two way streets in terms of offset, bandwidth, efficiency of band width and the upper limit of platooned volume that can be carried on each direction without stopping using time-space diagrams. (i) Alternate progression (ii) Simultaneous progression. [12]
4. Design an appropriate signal timing (passing plan, change and clearance intervals, cycle time and green splits) for an intersection of an East-West six lane arterial (three lanes in each direction) and a North-South four lane (two lanes in each direction) sub-arterial. The main arterial has one right and one left turning lanes in addition to the three lanes reserved for through traffic. The sub-arterial has no turning lanes. Assume PHF = 0.90 and desired V/C ration =0.90. There are no pedestrians at this location. Saturation flow at this intersection is 1700 through cars per hour per lane. Assume that lost time in each phase is equal to the clearance time. The volume count during morning peak hour yielded the following data.

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Movement	Number of vehicles (PCU) during peak hour			
	North Bound	South Bound	East Bound	West bound
Through	550	450	1100	1200
Right	50	60	280	300
Left	40	30	140	120

5. a) Explain the level of service concept as per the HCM manual. Describe six levels of service with a neat sketch.
 b) What are the factors affecting capacity and level of service? Explain the capacity of multilane rural highways without access control. [12]
6. a) Explain the procedure for investigating the accident? Recommend the valuable suggestions for minimization of accidents in view of engineering, enforcement and education? How do you analyze the accident data?
 b) How do you carryout parking space/slots inventory study? Explain various methods of parking inventory studies. [12]
7. a) How do you collect the accident data? Explain the role of road user, road, vehicles and environment in accidents. Suggest various measures to reduce accidents?
 b) What are the detrimental effects of traffic on the environment? How the noise generation will takes place by road traffic? [12]
8. Write a short note on any three of the following
 a) Environmental degradation due to traffic
 b) Off street parking system
 b) Gap acceptance studies
 c) Capacity of Urban streets
 d) Air Pollution [12]
