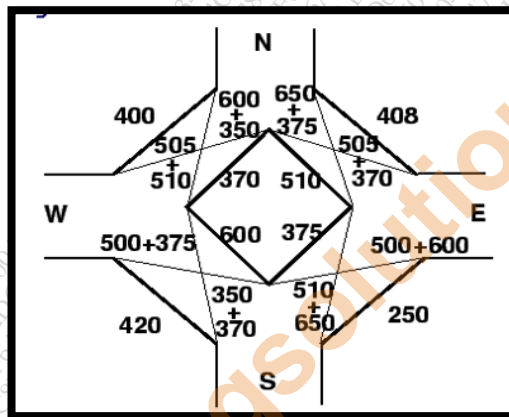


(3 Hours)

[Total Marks: 80

- Note:**
- i. Q. No. 1 is compulsory
  - ii. Attempt any 3 out of remaining 5
  - iii. Support all theory and numerical with neat sketch

1. Solve any four (20 M)
  - A. Enlist various traffic studies
  - B. Explain Area Traffic control (ATC)
  - C. Explain Basic, possible and practical capacity.
  - D. Write note on Traffic System Management
  - E. What are factors affecting trip generation and distribution?
  - F. What is Vehicle operating cost?
2. A. Design a rotary intersection for 2 highways meeting at right angle. Assume suitable data as per requirement. (08 M)



- B. Design street lighting system for western express highway near Dahisar. Assume suitable data and list the same. (06 M)
- C. Explain Moving observer method (06 M)
3. A. A 2-lane traffic system for 1800 veh/hr capacity is taken up for repair. If traffic flow is 1300 veh/hr on free section, find mean speed at the bottleneck. Assume headway of 7.2 m at jam condition. The maximum capacity at bottleneck is 1000 veh/hr. Also find the length of queue formed in 15 minutes. (08 M)
- B. Solve the following matrix for the future trip distribution using Furness Method: (06 M)

O/D	1	2	3	Pj
1	150	192	136	850
2	144	128	164	700
3	101	184	174	600
Aj	800	750	600	

- C. Discuss on ITS (06 M)

4. A. Estimate future year trip interchange between three zones using gravity model from the given data. Take  $n=2$  &  $k_{ij}= 1.2$  (08 M)

Zone	Production	Attraction	O-D	Travel Time
1	500	2	1-1	5
2	600	4	2-2	3
3	200	8	3-3	4
			1-2	10
			1-3	8
			2-3	15

- B. Multinational company want to invest 30,000cr in any one of the below projects suggest using IRR. (06 M)

Years	A in {cr}	B in {cr}
1	10,000	3,000
2	10,000	5,000
3	10,000	10,000
4	10,000	20,000
5	10,000	25,000

- C. Derive Q-K-V equation (06 M)

5. A. Find which project to be selected from the following using NPV and B/C if  $I = 6.5\%$  (08 M)

Project	A	B	C
Investment	100cr	100cr	100cr
Annual return 1	30	37.5	45
Annual return 2	35	37.5	40
Annual return 3	40	37.5	35
Annual return 4	45	37.5	30

- B. Discuss on any 1 method of parking survey in detail. (06 M)

- C. Explain four stage modelling (06 M)

6. A. What is role of statistics in Traffic Engineering? If at an uncontrolled T-Junction passed experience indicates probability of vehicles arriving on the side found during 15 sec intervals and turning right into the main road is  $1/5$ . Find probability that in a period of 1 minute, there will be 0, 1, 2, 3, 4 vehicles arriving and turning right. (08 M)

- B. Following is the details of trips transit between two zones having equations . If there are 20000 trips generated between the two zones find out the fair collected. (06 M)

$$u = A_o - 0.002(TT) - 0.001(TC) + 0.001(C)$$

Mode	$A_o$	Travel time (TT)min	Travel cost(TC)	Comfort (C)
Car	0	45	50	6
Bus	-0.001	65	35	2
LRT	-0.001	50	40	4

- C. What is PCU? What are factors affecting PCU? (06 M)