| Reg. No. | | | | | | | | | | |
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# MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
*(A constituent unit of MAHE, Manipal)*

**VII SEMESTER B.TECH. (CIVIL ENGINEERING)**
**END SEMESTER EXAMINATIONS, NOV/DEC 2018**
**SUBJECT: PE-4 URBAN TRANSPORTATION PLANNING [CIE 4028]**
**REVISED CREDIT SYSTEM**
**(27/11 /2018)**

Time of Exam: 2-5pm MAX. MARKS: 50

**Instructions to Candidates:**
- Answer ALL the questions & Missing data may be suitably assumed.

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| **1A.** | What is the significance of zoning in transportation planning? List out the guidelines for zoning. | **3** | **CO4** |
| **1B.** | What is origin destination survey? Explain the applications of origin destination survey in transport planning process. | **3** | **CO1, CO2, CO3** |
| **1C.** | Using the spot speed data given in the following table, collected from a freeway site operating under free-flow conditions: (i) Obtain median speed, modal speed (ii) Compute the mean and standard deviation of the speed distribution<br>Speed range: 21-25 \| 26-30 \| 31-35 \| 36-40 \| 41-45 \| 46-50 \| 51-55 \| 56-60 \| 61-65 \| 66-70 \| 71-75 \| 76-80<br>Frequency: 2 \| 6 \| 18 \| 25 \| 19 \| 16 \| 17 \| 12 \| 7 \| 4 \| 3 \| 1 | **4** | **CO1** |
| **2A.** | Write an essay on Garin Lowry model. | **4** | **CO4** |
| **2B.** | A self-sustained town consist of four residential areas A, B, C and D and two industrial estates X and Y. Generation equation show that for the design year in question the tips from home to work generated by each residential area per 24 hour day are as follows.<br>A 1000<br>B 2250<br>C 1750<br>D 3200<br>There are 3700 jobs in the industrial estate X and 4500 in industrial estate Y. It is known that the attraction between zones is inversely proportional to the square of the journey times between zones. The journey time in minutes from home to work are given below. Calculate and tabulate the inter zonal trips for journeys from home to work.<br>Zones: X: 15, 15, 10, 15 / Y: 20, 10, 10, 20 (A, B, C, D) | **6** | **CO3** |
| **3A.** | The calibrated utility functions for auto and transit travel are;<br>Auto: Va= -0.3-0.04X-0.l Y-0.03C<br>Transit: Vt= -0.04X-0.l Y-0.03C 5 C03<br>Where<br>Vi=utility function of mode i<br>X=in-vehicle travel time<br>Y=out-of-vehicle travel time<br>C=cost of travel /income | **5** | **CO3** |

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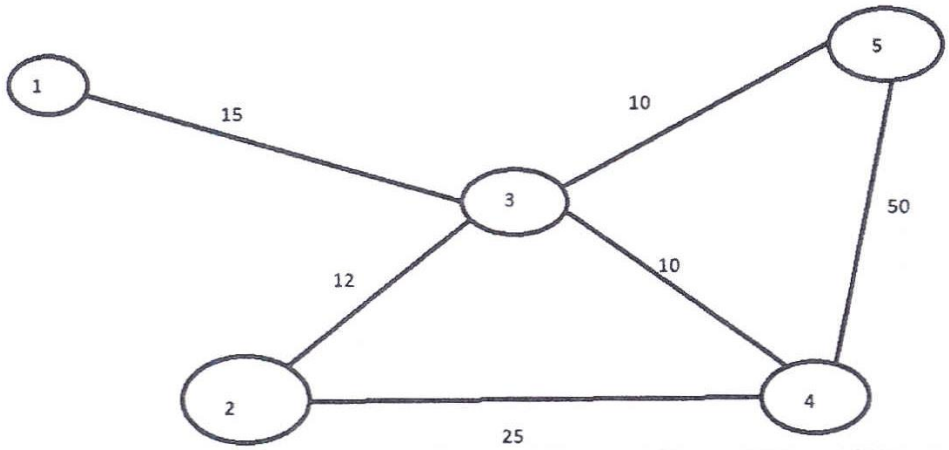
| | A traffic zone has the following characteristics:<br>Auto travel: In vehicle time 15, Out of vehicle time 5, Travel cost 300<br>Transit travel: In vehicle time 40, Out of vehicle time 10, Travel cost 75<br>What is the probability that a person with an income of $10000 will travel by transit? | | |
| **3B.** | Find the link flows using all or nothing assignment. The numbers on the link denote travel time and numbers in the circle denote zone numbers.<br>  <br>O\D: 1: 0, 0, 200, 100, 150; 2: 0, 0, 300, 300, 50; 3: 200, 300, 0, 100, 100; 4: 100, 300, 100, 0, 0; 5: 150, 50, 100, 0, 0 | **5** | **CO3, CO5** |
| **4A.** | Write a short note on minimum path with capacity restraints. | **4** | **CO3** |
| **4B.** | Describe parking survey and explain the different methods of the same. | **6** | **CO1** |
| **5A.** | Explain with suitable figures the internal form and function of an urban structure. | **3** | **CO5** |
| **5B.** | The row vector of total employment in each zone is [126, 177, 64, 216] and the row vector of the basic employment in each zone is [100, 150, 40, 200). Calculate the household vector and service employment vector with the help of the data given below.<br>Journey to shop function: $[b_{ij}]=\begin{bmatrix}0.50 & 0.25 & 0.10 & 0.15\\ 0.30 & 0.45 & 0.15 & 0.10\\ 0.15 & 0.20 & 0.40 & 0.25\\ 0.20 & 0.25 & 0.35 & 0.20\end{bmatrix}$ Journey to home function: $[a_{ij}]=\begin{bmatrix}0.35 & 0.30 & 0.20 & 0.15\\ 0.25 & 0.35 & 0.20 & 0.20\\ 0.15 & 0.10 & 0.35 & 0.40\\ 0.10 & 0.25 & 0.20 & 0.45\end{bmatrix}$<br>Labour participation rate: $[a_j]=\begin{bmatrix}0.80 & 0 & 0 & 0\\ 0 & 0.80 & 0 & 0\\ 0 & 0 & 0.80 & 0\\ 0 & 0 & 0 & 0.80\end{bmatrix}$ Service employment ratio: $[b_i]=\begin{bmatrix}0.20 & 0 & 0 & 0\\ 0 & 0.20 & 0 & 0\\ 0 & 0 & 0.20 & 0\\ 0 & 0 & 0 & 0.20\end{bmatrix}$ | **5** | **CO5** |
| **5C.** | Define traffic assignment. What are the applications of traffic assignment? | **2** | **CO3** |