B. Tech.

(SEM. VIII) EXAMINATION, 2006-07

TRAFFIC ENGINEERING

Time : 3 Hours] [Total Marks : 100

Note :
(1) Attempt all questions.
(2) All questions carry equal marks.
(3) Assume suitable data if required.
(4) Be precise in your answer.

1 Attempt any two parts of the following : 10x2=20

a) Explain the term “Traffic Engineering”. What are the duties of a traffic Engineer? How does the Traffic system in India differs from that in European Countries?

b) How does the slow moving vehicle affect the capacity of roads? Give examples of slow and fast moving vehicles and their PCU values.

c) Who are the different types of road users? Explain the factors which affect vehicle performance.
2 Attempt any two parts of the following: \(10 \times 2 = 20\)
   a) Define overall running or operating speed, peak our factor and traffic density.
   b) Establish relationship between space mean speed and volume, speed and density, and volume and density, and show it by diagram. Also define space and time headway.
   c) What do you understand by queuing theory? Where it is applied and which parameter can be worked out from this theory?

3 Attempt any two parts of the following: \(10 \times 2 = 20\)
   a) Spot speed studies were carried out at a certain stretch of highway and the consolidated data collected are given below:

<table>
<thead>
<tr>
<th>Speed range (Kmph)</th>
<th>No. of Vehicles observed</th>
<th>Speed Range (Kmph)</th>
<th>No. of vehicles observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10</td>
<td>12</td>
<td>51 to 60</td>
<td>255</td>
</tr>
<tr>
<td>11 to 20</td>
<td>18</td>
<td>61 to 70</td>
<td>119</td>
</tr>
<tr>
<td>21 to 30</td>
<td>68</td>
<td>71 to 80</td>
<td>43</td>
</tr>
<tr>
<td>31 to 40</td>
<td>89</td>
<td>81 to 90</td>
<td>33</td>
</tr>
<tr>
<td>41 to 50</td>
<td>204</td>
<td>91 to 100</td>
<td>9</td>
</tr>
</tbody>
</table>

   Determine (i) the upper and lower values of speed limits for regulations of mixed traffic flow and (ii) the design speed for checking the geometric design elements of the highway.
   b) Explain the terms AADT, hourly flow, and 30\(^{th}\) highest hourly volume. Where manual methods are preferred over automatic count methods for recording the traffic volume data.
   c) What is the use of origin and destination survey? Name the various O-D survey methods and give merits and demerits of each one.
4 Attempt any **four** parts of the following: $5 \times 4 = 20$

a) What are the functions of road signs? How many types of road signs you know? Explain each with minimum five examples with sketches.

b) How many types of over head signs are there and where these are provided?

c) How does the road marking helps in control of traffic? Give different type of road marking and explain the object and zebra line marking.

d) What are delineators? Explain the different types of delineators?

e) How the traffic rotaries are designed?

f) Write a short note on street lighting.

5 Attempt any **four** parts of the following: $5 \times 4 = 20$

a) What is a traffic island? Write the purpose of providing traffic island.

b) What is difference between a grade Separator and interchange? Explain with sketch a Cloverleaf type of interchange.

c) Give design criterion for a parking lot.

d) What do you understand by kerb parking? Compare it with off street parking.

e) Show the conflict points at the intersection of the following types:
   i) Cross road both two-way
   ii) T – Intersection, both two way
   iii) Cross road one way
   iv) Y-intersection one way.

f) Why the parking provided at the basement of a multi-storey building is dangerous?