



PAPER ID-410297

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM VI) THEORY EXAMINATION 2023-24
TRANSPORTATION ENGINEERING

TIME: 3 HRS**M.MARKS: 100****Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.**

a.	Write the major modes of transportation.	2
b.	Write the features of the third 20 years (Lucknow Road Plan) (1981-2001).	2
c.	What do you mean by geometric design?	2
d.	What are the cross-sectional elements of highway geometric design?	2
e.	List the type of road user characteristics.	2
f.	Determine the theoretical capacity of a traffic lane having one-way traffic flow at a stream speed of 40 kmph. Assume the average space gap between vehicles to follow the relation $S_g = 0.278 V t$. V is the stream speed in kmph and t is the average reaction times = 0.7 seconds and assume average length of vehicles = 5.0 m.	2
g.	Write the different types of emulsion.	2
h.	What are the constituents of mix?	2
i.	Write the types of highway construction.	2
j.	What do you mean by dry lean concrete?	2

SECTION B**2. Attempt any three of the following:**

a.	Briefly explain the engineering surveys needed for a highway project and the data to be collected.	10
b.	A parabolic camber is provided on a two-lane road of width 7.5 m in a region of heavy rainfall with thin bituminous surface. If it is proposed to construct the road with Cement concrete. Find the change in the height of the crown.	10
c.	Explain with a diagram effect of mounting and overhang on the shadow of the vehicle.	10
d.	Determine the unit weight of a bituminous mix containing 70% coarse aggregate, 24% fine aggregate, and 6% bitumen by weight of the mixture. The air voids after compaction are 8%. The specific gravities of the material are as under: Sp. Gravity of coarse aggregate = 2.80, Sp. The gravity of fine aggregate = 2.66, Sp. Gravity of bitumen = 1.00	10
e.	Describe specifications of materials for water-bound macadam roads.	10

SECTION C**3. Attempt any one part of the following:**

a.	Explain with sketches the various factors affecting the highway alignment,	10
b.	Write the recommendations made by the Jayakar committee and gives the accepted recommendations of the Jayakar committee.	10

4. Attempt any one part of the following:

a.	On a two-way traffic road, the speed of overtaking vehicles is 100 kmph and 50 kmph. If the average acceleration is 0.92 m/s^2 . Determine the overtaking distance. Draw a neat sketch of the overtaking zone and show the positions of the sign posts.	10
b.	Discuss gradients and its type. Specify the values recommended by IRC for plains and hills.	10



PAPER ID-410297

Printed Page: 2 of 2

Subject Code: KCE602

Roll No:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BTECH
(SEM VI) THEORY EXAMINATION 2023-24
TRANSPORTATION ENGINEERING

TIME: 3 HRS**M.MARKS: 100****5. Attempt any one part of the following:**

a.	Based on data for spot studies given in table. Calculate upper and lower speed limit regulation as well as speed for design.	10																						
	<table><tr><th>Speed Range (km/hr.)</th><th>Number of vehicles</th></tr><tr><td>0-10</td><td>12</td></tr><tr><td>10-20</td><td>18</td></tr><tr><td>20-30</td><td>68</td></tr><tr><td>30-40</td><td>90</td></tr><tr><td>40-50</td><td>207</td></tr><tr><td>50-60</td><td>252</td></tr><tr><td>60-70</td><td>21</td></tr><tr><td>70-80</td><td>44</td></tr><tr><td>80-90</td><td>32</td></tr><tr><td>90-100</td><td>9</td></tr></table>	Speed Range (km/hr.)	Number of vehicles	0-10	12	10-20	18	20-30	68	30-40	90	40-50	207	50-60	252	60-70	21	70-80	44	80-90	32	90-100	9	
Speed Range (km/hr.)	Number of vehicles																							
0-10	12																							
10-20	18																							
20-30	68																							
30-40	90																							
40-50	207																							
50-60	252																							
60-70	21																							
70-80	44																							
80-90	32																							
90-100	9																							
b.	Design two phases traffic signals by Webster's method using the following data. Take all red-time required for pedestrian crossing is 12 sec. and amber time of 2 sec. for each lane.	10																						
	<table><tr><th>Road</th><th>Average Normal Flow (in vehicle/hr.)</th><th>Saturation Flow (in vehicle/hr.)</th></tr><tr><td>A</td><td>400</td><td>1250</td></tr><tr><td>B</td><td>250</td><td>100</td></tr></table>	Road	Average Normal Flow (in vehicle/hr.)	Saturation Flow (in vehicle/hr.)	A	400	1250	B	250	100														
Road	Average Normal Flow (in vehicle/hr.)	Saturation Flow (in vehicle/hr.)																						
A	400	1250																						
B	250	100																						

6. Attempt any one part of the following:

a.	Explain desirable properties of road aggregates. The weight of coarse aggregate having specific gravity 2.65, which is filled into a cylinder of volume 0.003 m ³ is 5247 gm. What is angularity number?	10
b.	Explain with graphical representation of Equivalent Single Wheel Load stress concept.	10

7. Attempt any one part of the following:

a.	Describe step wise construction of cement concrete pavement.	10
b.	Write advantages and disadvantages of following; (i) Gravel Road (ii) Bituminous Road.	10