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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2024 Semester End Main Examinations

Programme: B.E.

Branch: Civil Engineering

Course Code: 22CV5PETRF

Course: Traffic Engineering

Semester: V

Duration: 3 hrs.

Max Marks: 100

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
 2. Missing data, if any, may be suitably assumed.
 3. Draw suitable sketches where necessary.

			UNIT - I				<i>CO</i>	<i>PO</i>	Marks																							
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.	1	a)	Discuss briefly various factors that affect road user characteristics.				<i>CO1</i>	<i>PO2</i>	10																							
		b)	Discuss the various short term and long term factors that affect road safety.				<i>CO3</i>	<i>PO6</i>	10																							
							UNIT - II																									
	2	a)	Spot speed studies were carried out at a certain stretch of highway with mixed traffic flow and the consolidated data collected are given below.				<i>CO2</i>	<i>PO2</i>	10																							
			<table border="1" style="width: 100%; border-collapse: collapse;"> <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>15</td> <td>50 to 60</td> <td>345</td> </tr> <tr> <td>10 to 20</td> <td>51</td> <td>60 to 70</td> <td>113</td> </tr> <tr> <td>20 to 30</td> <td>81</td> <td>70 to 80</td> <td>94</td> </tr> <tr> <td>30 to 40</td> <td>103</td> <td>80 to 90</td> <td>68</td> </tr> <tr> <td>40 to 50</td> <td>215</td> <td>90 to 100</td> <td>33</td> </tr> </tbody> </table>				Speed range, kmph	No. of vehicles observed	Speed range, kmph	No. of vehicles observed	0 to 10	15	50 to 60	345	10 to 20	51	60 to 70	113	20 to 30	81	70 to 80	94	30 to 40	103	80 to 90	68	40 to 50	215	90 to 100	33		
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		Determine: (i) the upper and lower values or speed limits for installing speed regulation signs at this road stretch and (ii) the design speed for checking the geometric design elements of the highway.																														
		b)	In a braking test, a vehicle travelling at a speed of 45 kmph was stopped by applying brakes fully and the skid marks were 6.3 m length. Determine the average skid resistance of the pavement surface.				<i>CO1</i>	<i>PO2</i>	5																							
		c)	Various vehicle characteristics are to be studied in order to provide proper road facilities and to improve performance of traffic so What are these characteristics that need to be considered by the Traffic Engineer.				<i>CO1</i>	<i>PO2</i>	5																							

		OR																									
3	a)	<p>The speed data collected for a segment of a national highway is given below. Draw a histogram of speeds, Determine the speed for median, modal speed and speed for regulation purpose. Also determine mean speed, standard deviation, coefficient of variation and standard error.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Speed Class</td><td>31-40</td><td>41-50</td><td>51-60</td><td>61-70</td><td>71-80</td><td>81-90</td><td>91-100</td><td>101-110</td><td>111-120</td><td>121-130</td></tr> <tr> <td>Frequency</td><td>24</td><td>38</td><td>58</td><td>76</td><td>42</td><td>32</td><td>22</td><td>15</td><td>9</td><td>4</td></tr> </table>	Speed Class	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	Frequency	24	38	58	76	42	32	22	15	9	4	<i>CO2</i>	<i>PO2</i>	10
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	b)	<p>Write an overview and explain the usability of various methods of presentation of OD data.</p>	<i>CO2</i>	<i>PO2</i>	10																						
UNIT - III																											
4	a)	<p>Enumerate the various types of intersections and bring out the basic principles of design.</p>	<i>CO</i>	<i>PO</i>	10																						
	b)	<p>Show the conflict points at the following types of intersections:</p> <ul style="list-style-type: none"> • Cross roads, both roads two way • Cross roads, one road one way • T- intersection both roads two-way • Y-intersection, one road one-way 	<i>CO1</i>	<i>PO2</i>	10																						
OR																											
5	a)	<p>Explain briefly the various factors to be considered in the design of rotary intersection.</p>	<i>CO1</i>	<i>PO2</i>	10																						
	b)	<p>The average normal flow of traffic on cross roads A and B during design period are 400 and 250 PCU per hour. The saturation flow values on these roads are estimated as 1250 and 1000 PCU per hour respectively. The all read time required for pedestrian crossing is 12 sec. Design two phase traffic signal with pedestrian crossing by Webster's method.</p>	<i>CO4</i>	<i>PO3</i>	10																						
UNIT - IV																											
6	a)	<p>Mention the applications of (a) accident location file (b) spot maps (c) collision diagrams and (d) condition diagrams.</p>	<i>CO2</i>	<i>PO6</i>	8																						
	b)	<p>Two trucks A and B of gross weight 7t and 12t approaching from right angles applied brakes and skid through distances 3.2m and 1.9m respectively before collision. After collision, truck A was thrown back making an angle of 50° with its original direction and skid through a further distance of 2.8m. After collision, truck B skid along a distance of 3.8 m, deviating at an angle of 60° from the original path. Estimate the initial speeds of approach of the two trucks. Assume mean value of skid resistance as 0.7.</p>	<i>CO2</i>	<i>PO6</i>	12																						

UNIT - V					
7	a)	Classify the different types of traffic signs and mention the general objective of each type of sign, With sketches show the general shape of these types of signs.	<i>CO1</i>	<i>PO6</i>	8
	b)	Explain the objective of travel demand management.	<i>CO3</i>	<i>PO6</i>	6
	c)	Explain the Intelligent Transport System and its user services.	<i>CO3</i>	<i>PO6</i>	6

REAPPEAR EXAMS 2023-24