


<b>Name:</b> <b>Enrolment No:</b>	
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**UPES**  
**End Semester Examination, December 2023**

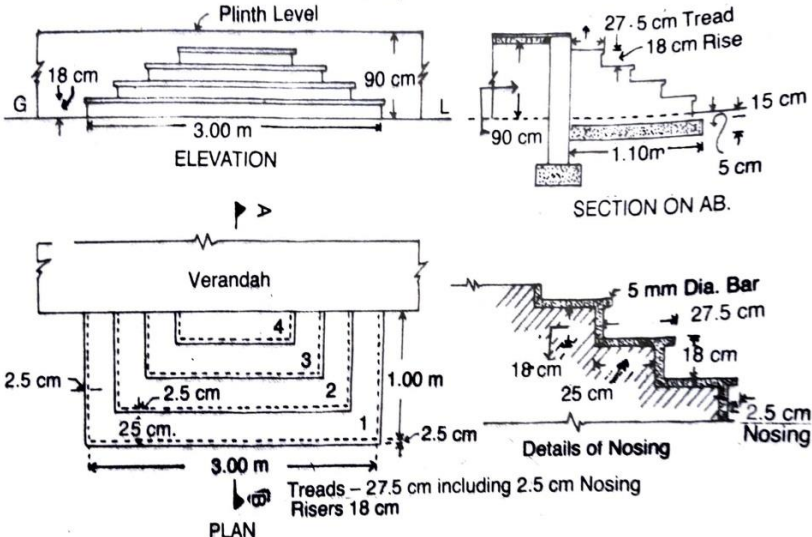
<b>Course: Engineering Economics, Estimation and Costing</b> <b>Program: B.Tech. Civil Engineering</b> <b>Course Code: CIVL 4066</b>	<b>Semester: VII</b> <b>Time: 03 hrs.</b> <b>Max. Marks: 100</b>
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**Instructions: All questions are compulsory to attempt.**

**SECTION A**  
**(5Qx4M=20Marks)**

S. No.		Marks	CO
Q 1.	State the essential differences between general and detailed specifications.	<b>04</b>	<b>CO2</b>
Q 2.	What is rate analysis? Discuss the procedure of rate analysis estimation in civil engineering works.	<b>04</b>	<b>CO4</b>
Q 3.	Define the term “Price Elasticity of Demand” and explain its relevance in the market statistics.	<b>04</b>	<b>CO1</b>
Q 4.	What is aggregate demand and state the procedure for calculating the same?	<b>04</b>	<b>CO1</b>
Q 5.	State the essential elements of engineering economics decision-making.	<b>04</b>	<b>CO1</b>

**SECTION B**  
**(4Qx10M= 40 Marks)**

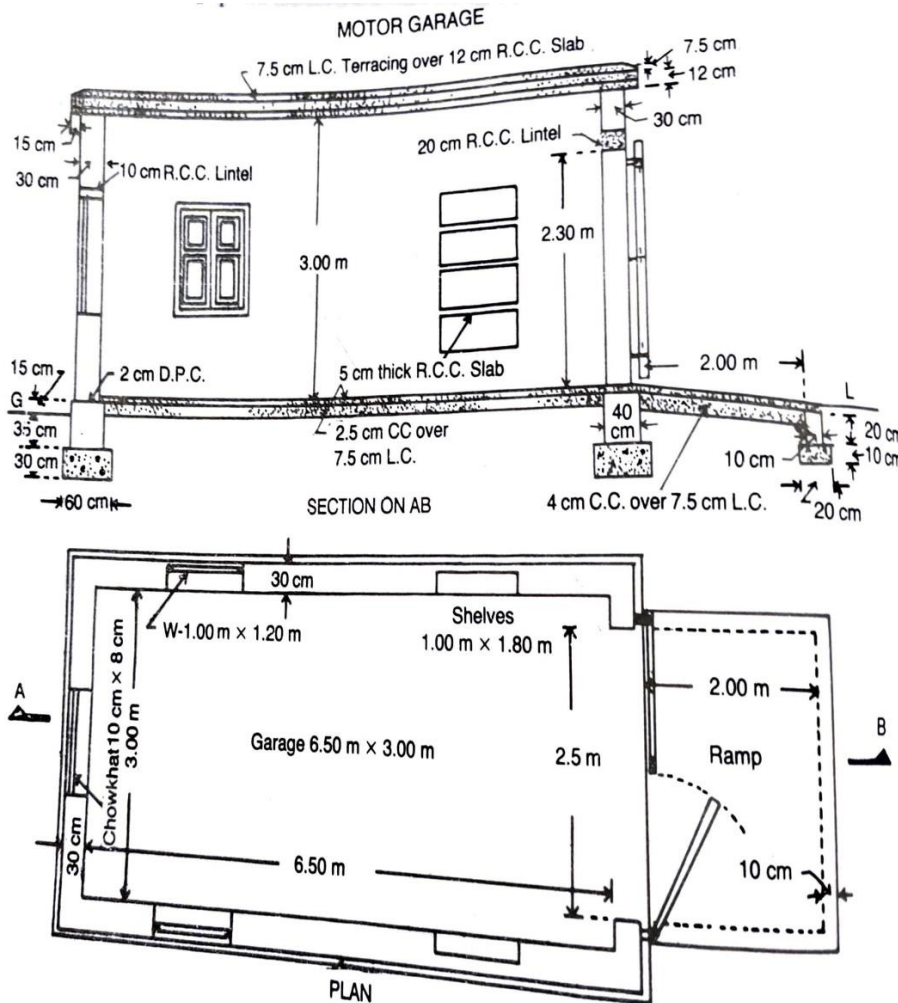
Q 6.	<p>Estimate the quantities of earthwork, concrete, brickwork, finishing and nosing work of three sides step given below in the drawings:</p> <div style="text-align: center;">  <p>The drawings show a three-sided step with a total width of 3.00 m. The elevation shows a height of 90 cm with a 18 cm rise and 27.5 cm tread. The section on AB shows a 1.10 m width and a 15 cm nosing. The plan shows a 3.00 m width with a 2.5 cm nosing. The details of nosing show a 5 mm dia. bar, 27.5 cm tread, 18 cm rise, and 2.5 cm nosing.</p> </div>	<b>10</b>	<b>CO2</b>
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Q 7.	Estimate the various quantity of materials required for 15 m <sup>3</sup> of first-class brickwork in superstructure with cement mortar (1:6).	<b>10</b>	<b>CO4</b>																																																												
Q 8.	Explain the LPG policies in macroeconomics along with their objectives and relevances.  OR Explain the term Gross Domestic Product (GDP) along with its relevance. Also discuss the different types of GDP.	<b>10</b>	<b>CO1</b>																																																												
Q 9.	Mr. Raghav is considering to invest Rs. 3,80,000 in a hardware business. The cash inflows during the first, second and third years are expected to be Rs. 1,35,000, Rs. 1,65,000 and Rs, 1,90,000, respectively. Cost of capital is 11.50%. Determine the IRR for the proposed investment and interpret your answer.	<b>10</b>	<b>CO1</b>																																																												
<b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b>																																																															
Q 10.	<p>a. Determine the quantity of earth work in an irrigation channel whose bed width is 6m and top widths of the left and right banks are 4m &amp; 2.5m respectively. Side slopes in excavation of the cannel is 1:1 and in banking 1.5:1. The height of the banks from the bed is 2.75m throughout. The RLs of ground and bed are as:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><i>Chainage</i></th> <th style="text-align: center;"><i>1</i></th> <th style="text-align: center;"><i>2</i></th> <th style="text-align: center;"><i>3</i></th> <th style="text-align: center;"><i>4</i></th> <th style="text-align: center;"><i>5</i></th> </tr> </thead> <tbody> <tr> <td style="text-align: left;"><i>RL of Ground (m)</i></td> <td style="text-align: center;">100.00</td> <td style="text-align: center;">100.31</td> <td style="text-align: center;">100.52</td> <td style="text-align: center;">100.57</td> <td style="text-align: center;">99.68</td> </tr> <tr> <td style="text-align: left;"><i>RL of Bed (m)</i></td> <td style="text-align: center;">98.50</td> <td colspan="3" style="text-align: center;">← 1 in 4500 D/W →</td> <td></td> </tr> </tbody> </table> <p>The length of the chain was 60m. Extra width beyond toe is 1.2 m on each side. Assume a free board of 0.50 m.</p> <p>b) Determine the cost of the permanent land required for the construction of the channel. The rate of the land is Rs. 18,000 per sq m.</p> <p>c) Determine the economical depth of digging.</p> <p style="text-align: center;">OR</p> <p>Reduced levels (RLs) of the ground in meters along the centre line of the proposed road from chainage 10 to chainage 18 are given below.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Longitudinal Slope</th> <th colspan="5">1 in 150 or 0.67%</th> <th colspan="4">1 in 100 or 1%</th> </tr> <tr> <th>Chainage</th> <th>10</th> <th>11</th> <th>12</th> <th>13</th> <th>14</th> <th>15</th> <th>16</th> <th>17</th> <th>18</th> </tr> </thead> <tbody> <tr> <td>RL of Ground (m)</td> <td>105</td> <td>105.6</td> <td>105.44</td> <td>105.9</td> <td>105.42</td> <td>104.3</td> <td>105</td> <td>104.1</td> <td>104.6</td> <td></td> </tr> <tr> <td>RL of Formation (m)</td> <td>107</td> <td>106.8</td> <td>106.6</td> <td>106.4</td> <td>106.20</td> <td>105.9</td> <td>105.6</td> <td>105.3</td> <td>105</td> <td></td> </tr> </tbody> </table>	<i>Chainage</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>RL of Ground (m)</i>	100.00	100.31	100.52	100.57	99.68	<i>RL of Bed (m)</i>	98.50	← 1 in 4500 D/W →				Longitudinal Slope	1 in 150 or 0.67%					1 in 100 or 1%				Chainage	10	11	12	13	14	15	16	17	18	RL of Ground (m)	105	105.6	105.44	105.9	105.42	104.3	105	104.1	104.6		RL of Formation (m)	107	106.8	106.6	106.4	106.20	105.9	105.6	105.3	105		<b>20</b>	<b>CO3</b>
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The formation level at 10<sup>th</sup> chainage is 107m and road is downward gradient of 1 in 150 upto chainage 14 and then gradient changes to 1 in 100 downwards. Formation width is 10m and side slopes are 2:1. Length of the chain is 35m. Draw longitudinal section of the road and a typical cross-section and prepare an estimate of earthwork at the rate of Rs. 290 per cubic meter.

Q 11. Estimate the quantities of the following items for a motor garage from the given plan and section by Long wall-Short wall method:

- a. Earthwork in excavation in foundation
- b. Lime concrete in foundation
- c. 1<sup>st</sup> class brickwork in foundation and plinth
- d. 2 cm thick DPC
- e. 1<sup>st</sup> class brickwork in superstructure
- f. RCC (1:2:4) work excluding steel and its bending



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CO3