| 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: ESTIMATING AND CONSTRUCTION MANAGEMENT [CIE 4101]

Date of Exam: 20-11-2018 Time of Exam: 2.00 to 5.00 pm MAX. MARKS: 50

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

<table>
<tr><td>1A.</td><td>What are the different purpose of estimation?</td><td>(02)</td><td>CO1</td></tr>
<tr><td>1B.</td><td>Write a note on (1) Complete estimate (2) Work charged establishment</td><td>(03)</td><td>CO1</td></tr>
<tr><td>1C.</td><td>A building is situated by the side of a main road on a land of 400 sqm area. The built up area of the building is 300 sqm. The age of the building is 20 years. From the recent sale instances, the present market value of the land and building is estimated as Rs. 15,000 per sqm and Rs. 8,000 per sqm respectively. Consider the life of the building as 60 years and the rate of annual sinking fund interest of 5%. Workout the present value of the property. (Use sinking fund method to calculate depreciation).</td><td>(05)</td><td>CO1</td></tr>
<tr><td>2A.</td><td>What is planning? Explain in detail, the roles and responsibilities of an Engineer during different stages of construction.</td><td>(04)</td><td>CO2</td></tr>
<tr><td>2B.</td><td>Following are the relationships between different activities making up a project. Draw a neat network for the interrelationships mentioned and number the events using Fulkerson's rule.<br>1. A and B are concurrent activities.<br>2. C follows A.<br>3. D and G start simultaneously and succeed B.<br>4. D is the only predecessor of activities E and F.<br>5. E and F cannot commence until A is completed.<br>6. Activity H succeeds activities C and F.<br>7. Activity I can commence only after the completion of E, G and H<br>8. Completion of activity I completes the project.</td><td>(06)</td><td>CO2</td></tr>
<tr><td>3A.</td><td>For the following activity table, i) Draw a network ii) Calculate the slack for each event iii) Determine the critical path (Use tabular approach).
<table>
<tr><th>Activity r</th><th>Predecessor</th><th>Duration (weeks)</th><th>Activity</th><th>Predecessor</th><th>Duration (weeks)</th></tr>
<tr><td>A</td><td>--</td><td>2</td><td>G</td><td>D,E,F</td><td>7</td></tr>
<tr><td>B</td><td>--</td><td>4</td><td>H</td><td>E,F</td><td>8</td></tr>
<tr><td>C</td><td>--</td><td>5</td><td>I</td><td>C</td><td>10</td></tr>
<tr><td>D</td><td>A</td><td>3</td><td>J</td><td>G</td><td>9</td></tr>
<tr><td>E</td><td>B</td><td>7</td><td>K</td><td>H,I</td><td>8</td></tr>
<tr><td>F</td><td>C</td><td>6</td><td colspan="3">J&K marks the completion of project</td></tr>
</table></td><td>(07)</td><td>CO2</td></tr>
<tr><td>3B.</td><td>With a graphical representation, explain the significance of direct, indirect and total cost curves associated with a project.</td><td>(03)</td><td>CO3</td></tr>
</table>

<table>
<tr><td>4A.</td><td>Table below shows the time-cost relation for activities in a project. Indirect cost of the project is Rupees 200 per day. Determine the minimum cost and optimum duration to complete the project. Show the cost results in tabular column with associated time scale network for each stage of crashing.
<table>
<tr><th>Activity</th><th>Normal duration (days)</th><th>Crash Duration (days)</th><th>Normal cost (Rs.)</th><th>Crash cost (Rs.)</th></tr>
<tr><td>1-2</td><td>20</td><td>15</td><td>1800</td><td>2800</td></tr>
<tr><td>1-5</td><td>120</td><td>100</td><td>12000</td><td>14000</td></tr>
<tr><td>2-3</td><td>40</td><td>30</td><td>16000</td><td>22000</td></tr>
<tr><td>2-4</td><td>60</td><td>45</td><td>13500</td><td>18000</td></tr>
<tr><td>3-4</td><td>30</td><td>20</td><td>1400</td><td>2000</td></tr>
<tr><td>4-5</td><td>50</td><td>40</td><td>3600</td><td>4800</td></tr>
</table></td><td>(07)</td><td>CO3</td></tr>
<tr><td>4B.</td><td>List and explain essential principles of organization.</td><td>(03)</td><td>CO4</td></tr>
<tr><td>5A.</td><td>List various factors that affect the selection of construction equipment. How do you classify the construction equipment based on its usage? Give appropriate examples</td><td>(04)</td><td>CO5</td></tr>
<tr><td>5B.</td><td>A 5 cubic meter diesel engine back hoe has the following data: Engine capacity- 250hp, crank case capacity- 30 Its, hours between oil change-100, operating factor- 0.6, useful life-7 years at 10% salvage value and 10% of average investment, hours operated per year-l ,600, shipping weight-150 MT, freight at ₹500 per MT, factory SB. cost-₹ 50,00,000", tax at 16%, miscellaneous charges at the time of delivery ₹ 20,000, bank interest on loan at 12%, cost of fuel < 75/lit and cost of lubricating oil is ₹600/lit. If the owner predicts a risk of 7% on the investment, calculate the probable owning and operating costs of the equipment.</td><td>(06)</td><td>CO5</td></tr>
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