MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B.TECH (CIVIL) END SEMESTER EXAMINATIONS
NOVEMBER 2022

SUBJECT: CONSTRUCTION MATERIALS AND QUALITY MANAGEMENT [CIE 4053]

Date of Exam: **/11/2022** Time of Exam: – am/pm Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitably assumed

Q. No	Questions	Marks	CO	BL
1A	Discuss material management functions for i) Purpose of material codification and ii) Material disposal.	**4**	**1**	**2**
1B	Discuss the significance of cost components on the total material cost.	**3**	**1**	**2**
1C	Discuss the standardization method as per ISO 3. List the benefits of standardization.	**3**	**2**	**2,1**
2A	Discuss the objectives of selective control in inventory. Discuss VED and HML selective control methods.	**2**	**2**	**2**
2B	Illustrate the material plan format highlighting key components.	**3**	**2**	**2**
2C	Classify the following material into A, B, and C classes.	**5**	**2**	**3**

Material code	Unit cost ($\times 10^3$ ₹)	Quantity consumed per annum ($\times 10^3$)
CM1	0.36	0.81
CM2	66.57	0.75
CM3	0.04	7.476
CM4	0.885	7.512
CM5	9.165	27
CM6	0.006	52.5
CM7	0.038	62.25
CM8	0.092	75.375
CM9	0.068	77.46
CM10	0.062	97.125

<table>
<tr><td>3A</td><td>The table shows the time series of cement prices per bag for two years. Suggest a better price forecasting technique between the moving average with N=3 and the exponential smoothening with N=3 and Alpha=0.2.

<table><tr><th>Year-1</th><th>Year-2</th></tr><tr><td>491</td><td>467</td></tr><tr><td>482</td><td>468</td></tr><tr><td>480</td><td>472</td></tr><tr><td>482</td><td>487</td></tr><tr><td>497</td><td>470</td></tr><tr><td>463</td><td>487</td></tr><tr><td>442</td><td>445</td></tr><tr><td>478</td><td>456</td></tr><tr><td>490</td><td>487</td></tr><tr><td>486</td><td>476</td></tr><tr><td>485</td><td>475</td></tr><tr><td>468</td><td>438</td></tr></table></td><td>5</td><td>3</td><td>3</td></tr>
<tr><td>3B</td><td>Discuss the factors which differentiate between the purchase of capital equipment and consumables.</td><td>3</td><td>3</td><td>2</td></tr>
<tr><td>3C</td><td>Discuss the stages of implementing QFD</td><td>2</td><td>5</td><td>2</td></tr>
<tr><td>4A</td><td>For the price data in the table below, develop a purchase strategy using the hindsight approach. Compute the total expenditure for the project plan period. The project requires 100 units per month and the maximum inventory capacity is 300 units.
<table><tr><td>Month</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Price (₹)</td><td>582</td><td>578</td><td>584</td><td>578</td><td>588</td><td>554</td><td>564</td><td>564</td><td>585</td><td>576</td></tr><tr><td>Month</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>Price (₹)</td><td>584</td><td>578</td><td>578</td><td>582</td><td>569</td><td>555</td><td>558</td><td>555</td><td>585</td><td>578</td></tr></table></td><td>4</td><td>3</td><td>3</td></tr>
<tr><td>4B</td><td>Compare Quality Assurance and Quality Control.</td><td>2</td><td>4</td><td>2</td></tr>
<tr><td>4C</td><td>Apply the internal rate of returns method and determine which equipment is more profitable at r=10 %, and the salvage value is 10 % of the cost.
<table><tr><th>Equipment</th><th>Capital Investment (lakh ₹)</th><th>GAR (lakh ₹)</th><th>ADED (lakh ₹)</th><th>Useful life (years)</th></tr><tr><td>A</td><td>9</td><td>3.6, 3.8, 3.2, 3, 2.4</td><td>1.38, 1.2, 1.2, 1.02, 1.14</td><td rowspan="2">5</td></tr><tr><td>B</td><td>12</td><td>6, 6.4, 7, 7.8, 7.4</td><td>2.8, 3, 2.6, 3, 2.8</td></tr></table></td><td>4</td><td>3</td><td>3</td></tr>
<tr><td>5A</td><td>Discuss, with a neat sketch, how a cause-and-effect diagram presents the possible causes of a problem.</td><td>4</td><td>5</td><td>2</td></tr>
<tr><td>5B</td><td>List all the quality control tools. Discuss the significance of any four of them.</td><td>3</td><td>5</td><td>1,2</td></tr>
<tr><td>5C</td><td>Draw a neat house of quality and label all its components.</td><td>3</td><td>5</td><td>1,2</td></tr>
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