

**MBA**  
**(SEM II) THEORY EXAMINATION 2021-22**  
**QUANTITATIVE TECHNIQUES FOR MANAGERS**

Time: 3 Hours

Total Marks: 100

Notes:

- Attempt all Sections and Assume any missing data.
- Appropriate marks are allotted in each question, answer accordingly.

SECTION-A		Attempt ALL of the following Questions in brief	Marked (10X2=20)	CG
Q1(a)	What do you mean by Operations Research?			
Q1(b)	What do you mean by states of nature?			
Q1(c)	What is duality?			
Q1(d)	What is Basic Feasible Solution of $m \times n$ transportation problem?			
Q1(e)	What do you mean by Unbalanced Assignment Problem?			
Q1(f)	What do you understand by Two Person Zero Sum Game?			
Q1(g)	In a sequencing problem, what is the meaning of total elapsed time?			
Q1(h)	What do you mean by Queue Discipline?			
Q1(i)	What do you mean by Gradual Failure and Sudden failure?			
Q1(j)	What is critical path in a network?			

SECTION-B		Attempt ANY ONE of the following:	Marked (2X15=30)	CG																																											
Q2(a)	<p>i) Solve the following LPP.</p> $\text{Max } Z = 2x_1 + 5x_2 + 7x_3$ <p>Subject to</p> $3x_1 + 2x_2 + 4x_3 \leq 100$ $x_1 + 4x_2 + 2x_3 \leq 100$ $x_1 + x_2 + 3x_3 \leq 100$ <p>Where <math>x_1, x_2, x_3 \geq 0</math></p> <p>ii) A company is faced with the problem of assigning five jobs to five machines; each job must be done on only one machine, the cost of processing each job on each machine is given below (in Rs.) Find out the optimal assignments.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="5">Machines</th> </tr> <tr> <th>M<sub>1</sub></th> <th>M<sub>2</sub></th> <th>M<sub>3</sub></th> <th>M<sub>4</sub></th> <th>M<sub>5</sub></th> </tr> </thead> <tbody> <tr> <th rowspan="5">Jobs</th> <th>J<sub>1</sub></th> <td>7</td> <td>5</td> <td>9</td> <td>8</td> <td>11</td> </tr> <tr> <th>J<sub>2</sub></th> <td>9</td> <td>12</td> <td>7</td> <td>11</td> <td>10</td> </tr> <tr> <th>J<sub>3</sub></th> <td>8</td> <td>5</td> <td>3</td> <td>6</td> <td>9</td> </tr> <tr> <th>J<sub>4</sub></th> <td>7</td> <td>3</td> <td>6</td> <td>9</td> <td>5</td> </tr> <tr> <th>J<sub>5</sub></th> <td>4</td> <td>6</td> <td>7</td> <td>5</td> <td>11</td> </tr> </tbody> </table>			Machines					M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>	M <sub>5</sub>	Jobs	J <sub>1</sub>	7	5	9	8	11	J <sub>2</sub>	9	12	7	11	10	J <sub>3</sub>	8	5	3	6	9	J <sub>4</sub>	7	3	6	9	5	J <sub>5</sub>	4	6	7	5	11			
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Q2(b)	<p>Phrase of the particular case (Example for Questions related with given phase in Sub Parts)</p> <p>i) A Company has four plants P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, from which it supplies to three markets M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>. Determine the optional transportation plan from the following data, given the plant to market shifting costs, quantities available at each plant and quantities required at each market.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Market</th> <th>Plant</th> <th>Required at</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Market	Plant	Required at																																											
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# 2nd Sem Paper

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web apr 17 2019 the best greatest engines you can buy today specifically an internal combustion engine is a heat engine in that it converts energy from the heat of burning gasoline into mechanical work or

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web the automotive engine management system market was valued at usd 61 36 billion and is projected to grow to usd 78 54 billion by 2027 registering a cagr of 4 2 in terms of revenue during the forecast period the covid 19 pandemic had a swift and negative impact on the globally integrated automotive industry

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web this chapter introduces the fundamental concepts in diesel engine system design and provides an overview on the theory and approaches in this emerging technical field the central theme is how to design a good engine system performance specification at an early stage of the product development cycle