

4/12

1105N253

Candidate's Seat No : _____

Integ LLB Sem.-3 Examination
 ILBBA 202
 O. R. & Q. T.
 May 2022

Time : 2-00 Hours]

[Max. Marks : 60

S.NO.	QUESTIONS	MARKS																																	
Q.1	<p>Solve the following transportation problem for minimising the total cost. If possible give alternate solution also.</p> <table border="1"> <thead> <tr> <th rowspan="2">Factory</th> <th colspan="3">Sales Depot</th> <th rowspan="2">Availability</th> </tr> <tr> <th>S1</th> <th>S2</th> <th>S3</th> </tr> </thead> <tbody> <tr> <td>F1</td> <td>7</td> <td>10</td> <td>5</td> <td>90</td> </tr> <tr> <td>F2</td> <td>12</td> <td>9</td> <td>4</td> <td>50</td> </tr> <tr> <td>F3</td> <td>7</td> <td>3</td> <td>11</td> <td>80</td> </tr> <tr> <td>F4</td> <td>9</td> <td>5</td> <td>7</td> <td>60</td> </tr> <tr> <td>Requirement</td> <td>120</td> <td>100</td> <td>110</td> <td></td> </tr> </tbody> </table>	Factory	Sales Depot			Availability	S1	S2	S3	F1	7	10	5	90	F2	12	9	4	50	F3	7	3	11	80	F4	9	5	7	60	Requirement	120	100	110		18
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Q.1(A)	What is O.R.? Explain the techniques and tools of O.R.	10																																	
Q.1 (B)	<p>Solve the following Game using dominance property.</p> <table border="1"> <thead> <tr> <th colspan="2" rowspan="2"></th> <th colspan="4">Player 2</th> </tr> <tr> <th>9</th> <th>5</th> <th>12</th> <th>8</th> </tr> </thead> <tbody> <tr> <th rowspan="4">Player 1</th> <th>13</th> <td>9</td> <td>5</td> <td>12</td> <td>8</td> </tr> <tr> <th>4</th> <td>13</td> <td>8</td> <td>19</td> <td>10</td> </tr> <tr> <th>9</th> <td>4</td> <td>9</td> <td>7</td> <td>13</td> </tr> <tr> <th>9</th> <td>9</td> <td>4</td> <td>14</td> <td>8</td> </tr> </tbody> </table>			Player 2				9	5	12	8	Player 1	13	9	5	12	8	4	13	8	19	10	9	4	9	7	13	9	9	4	14	8	08		
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P.T.O

Q.2	<p>A project has the following time schedule.</p> <table border="1" data-bbox="359 318 777 701"> <thead> <tr> <th>Activity</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1-2</td> <td>2</td> </tr> <tr> <td>1-3</td> <td>5</td> </tr> <tr> <td>2-4</td> <td>4</td> </tr> <tr> <td>3-4</td> <td>3</td> </tr> <tr> <td>3-5</td> <td>5</td> </tr> <tr> <td>4-6</td> <td>6</td> </tr> <tr> <td>5-7</td> <td>2</td> </tr> <tr> <td>6-7</td> <td>4</td> </tr> </tbody> </table> <p>Required:</p> <ol style="list-style-type: none"> 1) Draw the Diagram. 2) Identify the critical path & find the total project duration. 3) Determine EFT, EST, LFT, LST and Total float. 	Activity	Duration	1-2	2	1-3	5	2-4	4	3-4	3	3-5	5	4-6	6	5-7	2	6-7	4	18																
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OR																																				
Q.2 (A)	<p>Solve the following assignment problem. The data regarding production on different machines are given in the following table.</p> <table border="1" data-bbox="344 1251 1150 1607"> <thead> <tr> <th rowspan="2">Operator</th> <th colspan="4">Machines</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>15</td> <td>10</td> <td>12</td> <td>13</td> </tr> <tr> <td>2</td> <td>16</td> <td>9</td> <td>14</td> <td>14</td> </tr> <tr> <td>3</td> <td>13</td> <td>9</td> <td>14</td> <td>12</td> </tr> <tr> <td>4</td> <td>12</td> <td>10</td> <td>11</td> <td>9</td> </tr> <tr> <td>5</td> <td>13</td> <td>14</td> <td>12</td> <td>10</td> </tr> </tbody> </table>	Operator	Machines				A	B	C	D	1	15	10	12	13	2	16	9	14	14	3	13	9	14	12	4	12	10	11	9	5	13	14	12	10	10
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Q.2 (B)	<p>What is the objective of assignment problem? Explain the Hungarian Method in detail.</p>	08																																		
Q.3	<p>A company manufactures two kind of Machines each requiring different manufacturing technique. The Deluxe machine requires 18 hours of labours, 9 hours of testing and yields a profit of rupees 400. The second machine requires 3 hours of labour 4 hours of testing and yields a profit of rupees 200. There are 800 hours of labour and</p>	18																																		

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600 hours of testing available each month. A marketing forecast shown the monthly demand for the second machine to be no more than 150. The management wants to know the number of each model to produce monthly that will maximize total profit. Formulate and solve this as a linear programming problem graphically.

OR

Q.3 (A)

Represent the following information in form of a network. Find the expected time of each activity and obtain the critical path.

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Activity	Time Estimates (Weeks)		
	Optimistic	Pessimistic	Most Likely
1-2	4	9	14
2-3	1	5	18
2-4	8	10	17
3-5	3	6	8
4-5	2	4	5
4-6	3	7	10
5-7	3	7	10
5-8	4	8	9
7-9	4	9	14
8-9	2	6	10
9-10	4	11	18
6-10	4	7	9

Required:

- (1) Draw the network.
- (2) Determine the critical Path.

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Q.3 (B)	<p>Solve the following transportation problem using</p> <p>(1) North – West Corner rule (2) Least Cost Method.</p> <table border="1" data-bbox="353 454 1211 738"> <thead> <tr> <th rowspan="2">Sales Outlets</th> <th colspan="3">Plants</th> <th rowspan="2">Demand</th> </tr> <tr> <th>P1</th> <th>P2</th> <th>P3</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>7</td> <td>12</td> <td>9</td> <td>16</td> </tr> <tr> <td>S2</td> <td>8</td> <td>10</td> <td>6</td> <td>10</td> </tr> <tr> <td>S3</td> <td>10</td> <td>9</td> <td>12</td> <td>12</td> </tr> <tr> <td>Supply</td> <td>8</td> <td>11</td> <td>19</td> <td></td> </tr> </tbody> </table>	Sales Outlets	Plants			Demand	P1	P2	P3	S1	7	12	9	16	S2	8	10	6	10	S3	10	9	12	12	Supply	8	11	19		08
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Q.4(a)	<p>Short Notes (Any three out of Five)</p> <ol style="list-style-type: none"> 1) Explain in brief any three Limitation PERT. 2) List down the assumption of linear programming. 3) What are the types of estimates are taken for the duration of time of activities. Explain in brief. 4) Explain Matrix minima Method. 5) Write any three advantages of duality. 	09																												
(b)	<p>Objectives or one line answers or true false</p> <ol style="list-style-type: none"> (1) If maximin value = Minimax value then it is said to be that game has no saddle point. True or False. (2) In CPM completion of activity is called event. True of False. (3) List down any two uses of Linear Programming Problem. (4) What is the special case of linear programming problem? (5) Linear programming was introduced for _____ in the year _____. (6) What is the main objective of the assignment problem? (7) If all the elements of a particular column are _____ the corresponding elements of any other column, then that column is dominated by other column. 	07																												

