AD-3255
Third Year B. Sc. (Sem. VI) Examination
March/April - 2015
6001 : Operations Research
(New Course) (Elective Generic)

Time : 2 Hours] [Total Marks : 50

Instructions:
(1) Fill up strictly the details of signs on your answer book.

Name of the Examination:
THIRD YEAR B. SC. (SEM. VI)

Name of the Subject:
6001 : OPERATIONS RESEARCH (NEW)

Subject Code No.: 3 2 5 5 Section No. (1, 2, ....) Nil

Seat No.:

Student's Sign

(2) All questions are compulsory.
(3) Digits to the right of each question indicate its marks.
(4) Follows usual symbols.
(5) Use of scientific calculator is permissible.

1. Answer the following questions: (Any Two)

1) Solve the following A.P.

Programmers

\[
\begin{bmatrix}
1 & 2 & 3 \\
2 & 3 & 1 \\
3 & 1 & 2
\end{bmatrix}
\]

Programmes

(2) Solve the following game:

Player B

\[
B_1 \quad B_2
\]

Player A

\[
A_1 \quad \begin{bmatrix} -5 & 2 \\ -7 & -4 \end{bmatrix}
A_2
\]

(3) Solve the following T.P. by using NWCM:

<table>
<thead>
<tr>
<th>Sources</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>S2</td>
<td>8</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>S3</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Demand</td>
<td>6</td>
<td>10</td>
<td>15</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

AD-3255] 1 [ Conta......
2 (a) Solve the following A.P. optimally:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>72</td>
<td>39</td>
<td>52</td>
<td>25</td>
</tr>
<tr>
<td>22</td>
<td>29</td>
<td>49</td>
<td>65</td>
<td>81</td>
</tr>
<tr>
<td>27</td>
<td>39</td>
<td>60</td>
<td>51</td>
<td>40</td>
</tr>
<tr>
<td>45</td>
<td>50</td>
<td>48</td>
<td>52</td>
<td>37</td>
</tr>
<tr>
<td>29</td>
<td>40</td>
<td>45</td>
<td>26</td>
<td>30</td>
</tr>
</tbody>
</table>

(a) Solve the following A.P. optimally:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>24</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>22</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>20</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>34</td>
<td>16</td>
</tr>
</tbody>
</table>

(b) Solve the following A.P. optimally:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>26</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>28</td>
<td>4</td>
<td>26</td>
</tr>
<tr>
<td>38</td>
<td>19</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>19</td>
<td>26</td>
<td>24</td>
<td>10</td>
</tr>
</tbody>
</table>

(b) Solve the following A.P. optimally:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>24</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td>8</td>
<td>13</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>19</td>
<td>22</td>
</tr>
</tbody>
</table>

3 (a) Find the initial b.f.s. of the following T.P. by using VAM:

<table>
<thead>
<tr>
<th>Sources</th>
<th>Destinations</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td></td>
<td>11</td>
<td>13</td>
<td>17</td>
<td>14</td>
<td>250</td>
</tr>
<tr>
<td>S2</td>
<td></td>
<td>16</td>
<td>18</td>
<td>14</td>
<td>10</td>
<td>300</td>
</tr>
<tr>
<td>S3</td>
<td></td>
<td>21</td>
<td>24</td>
<td>13</td>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>Demand</td>
<td></td>
<td>200</td>
<td>225</td>
<td>275</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>

(a) Find the initial b.f.s. of the following T.P. by using LCM:

<table>
<thead>
<tr>
<th>Sources</th>
<th>Destinations</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td></td>
<td>21</td>
<td>16</td>
<td>15</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>S2</td>
<td></td>
<td>17</td>
<td>18</td>
<td>14</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>S3</td>
<td></td>
<td>32</td>
<td>27</td>
<td>18</td>
<td>41</td>
<td>19</td>
</tr>
<tr>
<td>Demand</td>
<td></td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
(b) Solve the following T.P. by using MODI method:

<table>
<thead>
<tr>
<th>Sources</th>
<th>Destinations</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>16</td>
<td>24</td>
<td>16</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand</td>
<td>72</td>
<td>102</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OR

(b) Solve the following T.P. by using MODI method:

<table>
<thead>
<tr>
<th>Sources</th>
<th>Destinations</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>19</td>
<td>30</td>
<td>50</td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>40</td>
<td>8</td>
<td>70</td>
<td>20</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Demand</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. (a) Find the value of the following game:

Player B

<table>
<thead>
<tr>
<th>Player A</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>A2</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>A3</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

(b) Use graphical method to solve the following game and find the value of the game:

Player B

<table>
<thead>
<tr>
<th>Player A</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>3</td>
<td>-5</td>
<td>0</td>
</tr>
<tr>
<td>A2</td>
<td>-4</td>
<td>-2</td>
<td>1</td>
</tr>
<tr>
<td>A3</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

(b) Use graphical method to solve the following game and find the value of the game:

Player B

<table>
<thead>
<tr>
<th>Player A</th>
<th>B1</th>
<th>B2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>-6</td>
<td>7</td>
</tr>
<tr>
<td>A2</td>
<td>4</td>
<td>-5</td>
</tr>
<tr>
<td>A3</td>
<td>-1</td>
<td>-2</td>
</tr>
<tr>
<td>A4</td>
<td>-2</td>
<td>5</td>
</tr>
<tr>
<td>A5</td>
<td>7</td>
<td>-6</td>
</tr>
</tbody>
</table>