MBAC 2004

M.B.A. DEGREE EXAMINATION, JUNE 2014.

Second Semester

General, Finance, Marketing, HRM, IB, RM, Tourism, OSCM, IM, HM

OPERATIONS MANAGEMENT/OPERATIONS RESEARCH AND MANAGEMENT

(2012–13 Batch onwards)

Time: Three hours  Maximum: 100 marks

PART A — (5 x 6 = 30 marks)

Answer any FIVE questions.

1. What do you mean by Production Management and Production Planning?

2. What are the functions of Production Manager?

3. What is Operations Research? What are the main characteristics of Operations Research?

4. Give the matrix form of representing a general LPP.
8. In a public telephone booth, the arrivals on an average are 12 per hour. A call on an average takes three minutes. If there is just one Phone, the proportion of the time the booth is expected to be idle?

(a) The expected number of callers in the booth at any time.

(b) The expected number of calls, the booth is expected to be idle.

(c) Find (Queueing Theory)

7. Solve the Game Theory whose payoff matrix is given by

\[
\begin{array}{c|ccc}
 & A_1 & A_2 & A_3 \\
\hline
B_1 & 5 & \ast & \ast \\
B_2 & 0 & 3 & \ast \\
B_3 & 1 & 3 & 1 \\
\end{array}
\]

6. Distinguish between PERT and CPm.

Predicted predecessor: A B C D E H I G

Activity: A B C D E H I J K

Construct a network for a project whose activities and their predecessor relationship are given in the table.
(a) Draw the project Network.
(b) Find the critical path.
(c) Find the probability of the project being completed in 31 days.

PART C — (1 × 20 = 20 marks)

Compulsory

17. Find the initial basic feasible solution to the following transportation problem using VAM, given the cost Matrix.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>20</td>
<td>25</td>
<td>28</td>
<td>31</td>
<td>200</td>
</tr>
<tr>
<td>S2</td>
<td>32</td>
<td>28</td>
<td>32</td>
<td>41</td>
<td>180</td>
</tr>
<tr>
<td>S3</td>
<td>18</td>
<td>35</td>
<td>24</td>
<td>32</td>
<td>110</td>
</tr>
<tr>
<td>Demand</td>
<td>150</td>
<td>40</td>
<td>180</td>
<td>170</td>
<td></td>
</tr>
</tbody>
</table>

PART B — (5 × 10 = 50 marks)

Answer any FIVE questions.


10. What is Production Planning and Control? What are its main Functions?

11. Solve the following LPP by Graphical Method.

Minimize \( Z = 20x_1 + 10x_2 \)
Subject to, \( x_1 + 2x_2 \leq 40 \)
\( 3x_1 + x_2 \geq 30 \)
\( 4x_1 + 3x_2 \geq 60 \)
\( x_1, x_2 \geq 0 \).

12. Construct a dual for the following primal.

Minimize \( Z = 6x_1 - 4x_2 + 4x_3 \)
Subject to constraints,
\( 6x_1 - 10x_2 + 4x_3 \geq 14 \)....... (i)
\( 6x_1 - 2x_2 + 6x_3 \geq 10 \)....... (ii)
\( 7x_1 - 2x_2 + 5x_3 \leq 20 \)....... (iii)
\( x_1 - 4x_2 + 5x_3 \geq 3 \)....... (iv)
\( 4x_1 + 7x_2 - 4x_3 \geq 20 \)....... (v)
Where \( x_1, x_2, x_3 \geq 0 \).
14. The company plans to consume 760 pieces of a particular component. Past records indicate that

\[
\begin{array}{cccccc}
& A & B & C & D & E \\
1 & 18 & 18 & 16 & 20 & 19 \\
2 & 17 & 18 & 21 & 23 & 20 \\
3 & 21 & 23 & 25 & 27 & 26 \\
4 & 18 & 20 & 14 & 14 & 12 \\
5 & 20 & 15 & 18 & 20 & 25 \\
\end{array}
\]

Men are processing time of each man in hours. Table using Hungarian method. The matrix entries.

15. Solve the following assignment problem shown in

\[
\begin{array}{cccc}
1 & 6 & 10 & 15 & 4 \\
2 & 5 & 4 & 3 & 6 & 2 \\
3 & 0 & 8 & 9 & 2 & 7 \\
4 & 0 & 6 & 4 & 1 & 5 \\
\end{array}
\]

16. Determine an initial basic feasible solution to the

West Corner Rule.

17. Determine transportation problem using North

Supply

\[
\begin{array}{cccc}
D1 & 10 & 12 & 16 \\
D2 & 14 & 15 & 18 \\
D3 & 16 & 17 & 20 \\
D4 & 18 & 20 & 22 \\
\end{array}
\]