BBA 3rd Semester Examination
June 2014
Subject – Operation Research
Subject Code - MSL 205

Time Allowed: 03 hours. Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: All questions carry equal marks. Ques. No. 1 is Compulsory and attempt two questions from each section.

1. Write short note on: (5x4)
   (a) Game Theory  (b) Saddle Point sequencing problem
   (c) Assignment Problem  (d) Principle of Dominance

SECTION A

2. Define Operations Research. Explain the different applications of Operations Research. (20)

3. Solve the following Assignment problem: (20)

   |   | A  | B  | C  | D  |
---|---|---|---|---|---|
1  |   | 10| 25| 15| 20|
2  |   | 15| 30| 5 | 15|
3  |   | 35| 20| 12| 24|
4  |   | 17| 25| 24| 20|

4. Solve the following Linear Programming Problem trough simplex method:
   \[ \text{Max } z = x_1 - x_2 + 3x_3 \]
   Subject to
   \[ x_1 + x_2 + x_3 \leq 10 \]
   \[ 2x_1 - x_2 \leq 2 \]
   \[ 2x_1 - 2x_2 + 3x_3 \leq 6 \]

SECTION B

5. Use VAM (Vogal Approx Method) to determine Initial Feasible Solution (20)

   |   | W_1 | W_2 | W_3 | W_4 | Supply |
---|---|-----|-----|-----|-----|-------|
F1 |   | 21  | 16  | 15  | 13  | 11    |
F2 |   | 17  | 18  | 14  | 23  | 13    |
F3 |   | 32  | 27  | 18  | 41  | 19    |
Demand |   | 6   | 10  | 12  | 15  | 43    |

6. There are seven jobs, each of which has to go through the machines A & B in the order AB. Processing times in hours are given below: (20)

   |   | Job |
---|----|
|   | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
| Machine A | 3   | 12  | 15  | 6   | 10  | 11  | 9   |
| Machine B  | 8   | 10  | 10  | 6   | 12  | 1   | 3   |

Find the job sequence to reduce the total time taken.

7. Use dominance principle to solve the game whose pay-off matrix is given by: (20)

\[
\begin{bmatrix}
-1 & -2 & 8 \\
7 & 5 & -1 \\
6 & 0 & 12
\end{bmatrix}
\]