MANIPAL UNIVERSITY JAIPUR
University under Section 2(f) of the UGC Act

Centre for Distance and Online Education

Guidelines for formatting your assignment.

- Assignments must be typed in a **Microsoft Word Document** as per the following instructions:
  - The front page should consist of the learner's name in **CAPITAL LETTERS** along with their Roll Number, Program, Semester, Course Name and Code.
  - **Page Size:** A-4
  - **Margin:** 1-inch on all sides
  - **Font:** Times New Roman
  - **Font Size:** 12
  - **Alignment:** Justified.
- The total page limit **shall not exceed 12 pages**.

Please ensure that completed assignments are typed and formatted as per the guidelines and the soft copies are uploaded on or before the submission cut-off date.

NOTE: You are advised to stick to the timelines of submissions.

Guidelines for submitting your assignment.

- The document size should not exceed **2 MB.**
- The assignment response document should **NOT** contain colourful images or highlighted text content.
- If the learner submitted the wrong assignment or wants to resubmit, it can be done on or before the cut-off date. **ONLY the latest uploaded file will be considered for evaluation.**
- **Content that has been directly copied from the Internet/SLM and Assignments that have been copied and shared among students will be automatically rejected and disqualified.**

NOTE: Assignment submissions are accepted only in .pdf format which should be readable by OCR. Kindly do not upload scanned copies of assignments.

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Things to recheck before clicking that submit button.

- Upon successful submission of IA in LMS, you can verify using the preview tab the document submitted against each subject. In case the file submitted has been corrupted or the wrong document submitted, it will not be considered for evaluation.
- If your assignment submission file is on a pen drive, please copy the files to the system's local drive and then upload them on LMS.

NOTE: WE DO NOT ENCOURAGE HANDWRITTEN ANSWER SHEETS. THE USE OF AI TOOLS IS HIGHLY DISCOURAGED. ANY STUDENT FOUND USING THEM WILL BE PENALIZED.

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ASSIGNMENT

SESSION	**FEBRUARY - MARCH 2024**
PROGRAM	**MASTER OF BUSINESS ADMINISTRATION (MBA)**
SEMESTER	**II**
COURSE CODE & NAME	**DMBA205- OPERATIONS RESEARCH**
CREDITS	**04**
NUMBER OF ASSIGNMENTS & MARKS	**02** **30 MARKS EACH**

Note: *Answer all questions. Kindly note that answers for 10 marks questions should be approximately 400 - 450 words. Each question is followed by an evaluation scheme.*

<table>
<tr><th>Q.No</th><th>Assignment Set – 1
Questions</th><th>Marks</th><th>Total Marks</th></tr>
<tr><td>1.</td><td>What is Operations Research? Explain the Methodology used to solve Operations Research Problems in brief.</td><td>4+6</td><td>10</td></tr>
<tr><td>2.</td><td>Solve the following linear programming problem using its Dual form:
$Minimize\ Z = 3x_1 + 4x_2$
$Subject\ to: \quad 4x_1 + x_2 \geq 30$
$-x_1 - x_2 \leq -18$
$x_1 + 3x_2 \geq 28$
$where\ x_1, x_2 \geq 0$</td><td>4+6</td><td>10</td></tr>
<tr><td>3.</td><td>A firm marketing a product has four salesman S1, S2, S3 and S4. There are three customers to whom a sale of each unit to be made. The chance of making a sale to a customer depend on the salesman customer support. The data depicts the probability with which each of the salesman can sell to each of the customers.
<table>
<tr><td></td><td colspan="4">Salesman</td></tr>
<tr><td>Customer</td><td>S1</td><td>S2</td><td>S3</td><td>S4</td></tr>
<tr><td>C1</td><td>0.7</td><td>0.4</td><td>0.5</td><td>0.8</td></tr>
<tr><td>C2</td><td>0.5</td><td>0.8</td><td>0.6</td><td>0.7</td></tr>
<tr><td>C3</td><td>0.3</td><td>0.9</td><td>0.6</td><td>0.2</td></tr>
</table>
If only one salesman is to be assigned to each of the customers, what combination of salesman and customers shall be optimal. Give further that the profit obtained by selling one unit of C1 is Rs. 500, whereas it is respectively Rs 450 and Rs. 540 for sale to C2 and C3. What is the expected profit?</td><td></td><td>10</td></tr>
</table>

Q.No	Assignment Set – 2 Questions	Marks	Total Marks
4.	What is Monte Carlo simulation? Explain Monte Carlo Simulation Procedure in brief.	**4+6**	**10**

<table>
<tr>
<td>5.</td>
<td>A small project is composed of seven activities, whose time estimates are listed in the table below:
<table>
<tr><th rowspan="2">Activity (i – j)</th><th colspan="3">Estimated Duration (Weeks)</th></tr>
<tr><th>Optimistic</th><th>Most Likely</th><th>Pessimistic</th></tr>
<tr><td>1 – 2</td><td>1</td><td>1</td><td>7</td></tr>
<tr><td>1 – 3</td><td>1</td><td>4</td><td>7</td></tr>
<tr><td>1 – 4</td><td>2</td><td>2</td><td>8</td></tr>
<tr><td>2 – 5</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>3 – 5</td><td>2</td><td>5</td><td>14</td></tr>
<tr><td>4 – 6</td><td>2</td><td>5</td><td>8</td></tr>
<tr><td>5 – 6</td><td>3</td><td>6</td><td>15</td></tr>
</table>
i) Draw the network diagram of activities in the project.
ii) Find the expected duration and variance for each activity. What is the expected project length?
iii) Calculate the variance and standard deviation of the project length. What is the probability that the project will be completed atleast 4 weeks earlier than expected time.
<table>
<tr><td>Z</td><td>0.67</td><td>1.00</td><td>1.33</td><td>2.00</td></tr>
<tr><td>Prob.</td><td>0.2514</td><td>0.1587</td><td>0.0918</td><td>0.0228</td></tr>
</table>
</td>
<td>2+4+4</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>There is a game between the two players A and B where A is maximizing player and B is minimizing player. Player A wins B’s coin if the two coins total are equal to odd number and losses his coin if total to two coins is even. It is game of 1, 2, 5, 10 and 50 rupees coins. Determine the payoff matrix, the optimal strategies for each player and the value of the game to A.</td>
<td>4+4+2</td>
<td>10</td>
</tr>
</table>