JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

COURSE CODE (CREDITS): 19B1WCI737 (3) MAX. MARKS: 25

COURSE NAME: Optimization Methods in Business Analytics

COURSE INSTRUCTORS: Meghna Dhalaria MAX. TIME: 1 Hour 30 Minutes

***Note: Note:*** *(a) All questions are compulsory.*

*(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

*(c) Use of Calculator is allowed*



<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>A logistics company distributes electronic components from three warehouses (W1, W2, W3) to four retail stores (R1, R2, R3, R4). The company has estimated the profit per unit (in ₹) earned from transporting the goods from each warehouse to each retail store as shown below:<br><br>
<table>
<tr><td></td><td>R1</td><td>R2</td><td>R3</td><td>R4</td><td>Supply</td></tr>
<tr><td>W1</td><td>45</td><td>32</td><td>28</td><td>40</td><td>120</td></tr>
<tr><td>W2</td><td>50</td><td>36</td><td>34</td><td>25</td><td>80</td></tr>
<tr><td>W3</td><td>42</td><td>38</td><td>30</td><td>35</td><td>100</td></tr>
<tr><td>Demand</td><td>60</td><td>40</td><td>100</td><td>100</td><td></td></tr>
</table>
<br>The objective is to determine the initial feasible allocation of goods from warehouses to retail stores using the Vogel's Approximation Method (VAM) such that the total profit is maximized.</td><td>[3]</td><td>[7]</td></tr>
<tr><td>Q2</td><td>A company wants to assign five workers (A, B, C, D, and E) to five different tasks (A, B, C, D, and E). The profit (in ₹) associated with assigning each worker to each task is given in the following table. An entry marked as 'X' indicates that the corresponding assignment is not possible.<br><br>
<table>
<tr><td></td><td>Task A</td><td>Task B</td><td>Task C</td><td>Task D</td><td>Task E</td></tr>
<tr><td>Worker A</td><td>8</td><td>2</td><td>X</td><td>5</td><td>4</td></tr>
<tr><td>Worker B</td><td>10</td><td>9</td><td>2</td><td>8</td><td>4</td></tr>
<tr><td>Worker C</td><td>5</td><td>4</td><td>9</td><td>6</td><td>X</td></tr>
<tr><td>Worker D</td><td>3</td><td>6</td><td>2</td><td>8</td><td>7</td></tr>
<tr><td>Worker E</td><td>5</td><td>6</td><td>10</td><td>4</td><td>3</td></tr>
</table>
<br>Determine the optimal assignment of workers to tasks using the Hungarian Method such that the total profit is maximized.</td><td>[3]</td><td>[7]</td></tr>
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(47)