JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

BBA IV Semester

COURSE CODE (CREDITS): 24BBWHS431 (4) MAX. MARKS: 35

COURSE NAME: PRODUCTION AND OPERATIONS MANAGEMENT

COURSE INSTRUCTORS: ASA MAX. TIME: 2 Hours

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

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

<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>Kisan Tools Ltd., a leading manufacturer of agricultural tools, plans to open a new distribution center (DC) to serve major farming zones in Punjab and Haryana. To optimize logistics, the company will evaluate three potential plant sites using the load-distance method. The information is given below:
Customer Zone Data
<table><tr><th>Customer City</th><th>Coordinates (x,y)</th><th>Monthly Demand (Truckloads)</th></tr><tr><td>Ludhiana</td><td>(2,6)</td><td>25</td></tr><tr><td>Hisar</td><td>(6,2)</td><td>20</td></tr><tr><td>Karnal</td><td>(4,8)</td><td>30</td></tr><tr><td>Bathinda</td><td>(1,4)</td><td>15</td></tr></table>Plant Location Options
<table><tr><th>Location (City)</th><th>Coordinates (x,y)</th></tr><tr><td>Patiala</td><td>(3,5)</td></tr><tr><td>Panipat</td><td>(5,7)</td></tr><tr><td>Ambala</td><td>(4,9)</td></tr></table>Which location is better in terms of total load-distance score? Show your calculations also.</td><td>5</td><td>8</td></tr>
<tr><td>Q2</td><td>Agro Fresh Foods Pvt. Ltd., an FMCG company specializing in packaged dairy and organic products, plans to set up a new processing plant in North India. The company is considering three potential locations: Rohtak (Haryana), Bhiwadi (Rajasthan), and Ludhiana (Punjab). Each location has different fixed and variable costs due to differences in land prices, labor availability, taxes, and logistics.
The management expects a production volume of up to 100,000 units per month. The selling price per unit is projected at ₹50. Cost Structure for each location is given below:
<table><tr><th>Location</th><th>Fixed Cost (₹ per month)</th><th>Variable Cost (₹ per unit)</th></tr><tr><td>Rohtak</td><td>₹20,00,000</td><td>₹22</td></tr><tr><td>Bhiwadi</td><td>₹15,00,000</td><td>₹26</td></tr><tr><td>Ludhiana</td><td>₹18,00,000</td><td>₹24</td></tr></table></td><td>4</td><td>6</td></tr>
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	a) Calculate the break-even volume for each location. b) Identify the most cost-effective location at each volume level. c) How can break-even analysis be combined with strategic factors in plant location decisions?		
Q3.	IndiGrid Cables Pvt. Ltd., an electrical equipment manufacturer operating for 50 weeks in a year, is reviewing its inventory policy for copper cables, a key raw material. The company faces a consistent weekly demand of 8,000 meters of cable, which it procures at ₹240 per meter. Every time an order is placed, the company incurs a fixed cost of ₹1,050 for administrative processing and ₹1,650 for delivery, bringing the total ordering cost to ₹2,700 per replenishment. Additionally, the annual holding cost is estimated at 25% of the inventory value, reflecting storage, insurance, and capital costs. The company does not permit stockouts and wants to determine the most cost-effective ordering strategy. You are required to calculate the optimal order quantity (EOQ) using the Economic Order Quantity model. Based on this, determine how many orders should be placed annually, the time between orders, and the total annual costs associated with ordering and holding inventory. Furthermore, if the company sells the copper cable at ₹360 per meter, compute the gross profit for the year. Finally, discuss how this analysis might differ if the company's goal were to maximize profits rather than simply minimize inventory costs. In your response, consider factors such as bulk purchase discounts, capital constraints, storage limitations, and how inventory decisions affect cash flow.	**5**	**8**
Q4	What do you understand by Plant Location? What are different strategies a should be considered in case of location choice for an existing organization?	**4**	**5**
Q5	With the help of a Quantity-Cost Curve, explain the significance of economic order quantity. What are the limitations in using the formula for EOQ?	**3**	**4**
Q6	Short answer (max 50 words): a) Design of Services b) Production System c) Lean Supply Chain d) Productivity	**1**	**1x4=4**