**JAIPURIA INSTITUTE OF MANAGEMENT, INDORE**

**PGDM**

**FIFTH TRIMESTER (Batch 2020-22)**

**END TERM EXAMINATION, JAN-2022**

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| --- | --- | --- | --- |
| Course Name | **Materials and Inventory Management** | Course Code | **40524** |
| Max. Time | **2 hours** | Max. Marks | **40** |

**INSTRUCTIONS:**

Students can use MS Excel to answer questions. However following instructions MUST be followed.

* Solution generated on Excel must be stored in MS Excel file with student name as file name and file must be submitted to exam invigilator before leaving examination hall.
* Analysis of output solution must be done in physical (pen & paper form) in the answer sheet.

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**Q1**. Sonaka Tractors, a major Indo-Japanese tractor manufacturer was immensely benefitted by application of Materials management concepts in the company which manufactures Farm equipment. Following is the data for a gear box component for six months. (There is NO opening Inventory. The available work force as on 01 January is 40 workers. Make all other assumption deemed necessary). Four Materials and Inventory Management plans are proposed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | **January** | **February** | **March** | **April** | **May** | **June** |
| Demand Forecast | 1000 | 1200 | 1200 | 1400 | 1200 | 1200 |
| No. of Working Days (@8 hours per day) | 24 | 20 | 22 | 24 | 24 | 22 |

|  |  |
| --- | --- |
|  | **Cost (Rs.)** |
| Material cost  | 1000/unit |
| Inventory carrying cost  | 120/unit/month |
| Marginal Stock out cost  | 600/unit/month |
| Subcontracting cost (Including Material cost) | 1600/unit/month |
| Hiring and training cost  | 2000/worker |
| Layoff cost | 3000/worker |
| Labour hour requirement | 6/unit |
| Normal Labour hour cost (Regular Hours) | 40/hour |
| Over time cost | 60/hour |

1. Produce as per exact monthly requirement and vary workforce
2. Maintain constant workforce to meet average demand and allow inventory to manage fluctuations in demand.
3. Produce as per minimum demand and subcontract for extra demand.
4. Produce at a constant workforce to meet average demand with Overtime and Idle Time for excess or less demand.

Compare all the four plans and suggest the best plan. **(4 x 3 = 12 Marks)**

**Q2.** Super Foods is a manufacturer of wheat breads. The company operates 365 days a year and uses premium Sarbati wheat for manufacture of breads. The fortnightly demand of wheat is 1600 kg. The standard deviation of daily demand is 80 Kg and lead time is Two days. The company wish to ensures 95 % availability of this raw material (Z = 1.645). The ordering cost is Rs 120/- per order and carrying cost is 12 % of the unit cost per year. Each Kg of wheat costs Rs. 30/-. Apply inventory management concept and find out Economical Order Quantity, Total Cost of this inventory policy and Reorder Point. **(2 + 3 + 3 Marks)**

**Q3.** “Kaizen Tele components” is a manufacturer of telecom components for major telecom brands like Airtel, Reliance Jio, Vodafone-Idea, BSNL etc. etc. One of their major and critical component is an electronic component “ZZZ”. The company has assigned ratings to it three suppliers on a 1-10 point scale where 1 is least preferred and 10 is most preferred. Quality has a weightage of 0.72 in final evaluation, Cost has a weightage of 0.18 in final evaluation and vendor reputation has a weightage of 0.10 in the final evaluation. Data for three vendors is presented below: -

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Performance Criteria** | **Factor Rating weightage** | **Supplier A** | **Supplier B** | **Supplier C** |
| Quality | System Reliability | 0.19 | 5 | 8 | 6 |
| Technical Features | 0.17 | 8 | 6 | 5 |
| System Performance | 0.15 | 7 | 6 | 9 |
| Comply to Standards | 0.12 | 7 | 5 | 9 |
| System Capacity | 0.11 | 9 | 7 | 2 |
| Interoperability | 0.10 | 9 | 7 | 9 |
| Upgradability | 0.08 | 6 | 8 | 5 |
| R & D Capability | 0.05 | 7 | 4 | 9 |
| System Redundancy | 0.03 | 7 | 8 | 7 |
| Cost | Repairing (Post warranty) Cost | 0.09 | 8 | 6 | 8 |
| Normal working Cost | 0.07 | 7 | 4 | 7 |
| Maintenance (Wear and Tear) Cost | 0.04 | 8 | 6 | 7 |
| Unit Cost | 0.35 | 6 | 8 | 5 |
| Networking (Interfacing) Cost | 0.30 | 9 | 7 | 5 |
| Cost of Installation | 0.15 | 8 | 6 | 7 |
| Vendor Reputation | Sticking to Schedule (Delivery) | 0.20 | 5 | 9 | 7 |
| Packaging | 0.17 | 8 | 6 | 9 |
| Documentation | 0.05 | 9 | 7 | 3 |
| Quality of Support Service | 0.10 | 8 | 7 | 8 |
| Technical Expertise | 0.14 | 9 | 9 | 9 |
| Experience in related Product | 0.15 | 9 | 7 | 8 |
| Problem Solving Capability | 0.19 | 9 | 5 | 8 |

 The annual demand of this component is 1.5 million units. The company wish to maintain minimum three suppliers and has a policy of allocating 55 % requirement to the best vendor, 35 % to the second best vendor and 10 % to the third best vendor. Evaluate the vendors and recommend annual allocation of materials to various vendors.

**(10 Marks)**

**Q4.** Identify an organization of your choice and explain following :-

1. Benefits and limitations of Reverse Auction
2. E-Procurement benefits in Automobile Manufacturing sector
3. E-Procurement benefits in Apparels Retail sector
4. Circular Economy practices followed

**(2.5 x 4 = 10 Marks)**