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**Presidency University**

**Bengaluru**

**SCHOOL OF MANAGEMENT**

**MAKE UP EXAMINATION – SEPTEMBER 2023**

**Course Code**: MGT 152

**Course Name**: Operations Management

**Program** : BBA

**Date**: 01.10.2023

**Time**: 1:00PM – 4:00PM

**Max Marks**: 100

**Weightage**: 50%

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Calculator is allowed for this exam*

**Part A [Memory Recall Questions]**

**Answer all the Questions. (10Qx3M=30M)**

1. Toyota Production System (TPS) is the Japanese Toyota’s approach which focus on two important aspects of operations. The company adopted this approach because of the availability of limited resources and also the economic situation after the second world war. Their approach was a mystery until James Womack and et. al. published a book in the year 1990. They defined waste as anything that did not add value to, the product that they are manufacturing   (C.O.No.6) [Knowledge]
   1. Identify the two important aspects of TPS mentioned in the paragraph?
   2. Name the title of the book that unveiled the Toyota’s approach of production to the world?
   3. Name the person behind the implementation of JIT operations in Toyota?
2. Match the following (C.O.No.6) [Knowledge]

|  |  |  |  |
| --- | --- | --- | --- |
| 1. Contributed for consequences for poor quality manufacturing |  | A | Edward Deming |
| 1. Given 14 points for achieving Quality |  | B | Genichi Taguchi |
| 1. Pioneer of Quality Revolution – Father of Statistical Quality Control |  | C | Taiichi Ohno |
| 1. Kaizen Principle – Continuous Improvement |  | D | Walter Shewhart |
| 1. Viewed Quality as fitness-to-use; regarded as a major force in Japanese Success in Quality. |  | E | James Womack |
| 1. Published a book on Japanese Success in Quality |  | F | Joseph M. Juran |

1. Match the Following (C.O.No.2) [Comprehension]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Job Shop Production System |  | A | Pharma Industry |
|  | Mass Production System |  | B | Construction Industry |
|  | Custom Manufacturing System |  | C | Ship Manufacturing |
|  | Batch Production System |  | D | Beverages |
|  | Flexible Manufacturing System |  | E | Electronics |
|  | Cellular Manufacturing |  | F | Tailored Suits |

1. Fill in the blanks with the words given below (C.O. No. 2) [Comprehension]

|  |  |  |
| --- | --- | --- |
| S.No | *Operation* | *Description* |
|  | Planning | Deciding for the \_\_\_\_\_\_\_\_\_\_\_ course of actions |
|  | Routing | Sequencing of \_\_\_\_\_\_\_\_\_\_\_ |
|  | Scheduling | \_\_\_\_\_\_\_\_\_\_\_ Planning |
|  | Loading | Introduction of \_\_\_\_\_\_\_\_\_ into Production Processes |
|  | Inspection | Checking and \_\_\_\_\_\_\_\_\_\_ of processes |
|  | Dispatching | \_\_\_\_\_\_\_\_\_\_\_ of the manufactured products |

*Words:* (1) Time (2) Future (3) Verification (4) Delivery (5) operation (6) Materials (7) Trail

1. Match the following (C.O.No.6) [Knowledge]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ISO 9000 |  | A. | Pertains to the quality and performance of equipment that contains reused components |
|  | ISO 14000 |  | B. | Pertains to Quality Management and Operations |
|  | ISO / IEC 24700 |  | C. | Pertains to Organization that have eco-friendly practices in its operations |

1. Identify the Inventory Model used to classify the materials in the inventory based on the principle given. (C.O.No.5) [Comprehension]
   1. Classification based on the significance of the material \_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Classification based on the value of materials consumed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. True or False (C.O.No.6) [Knowledge]
   1. Kanban: Quality at the source. (T/F)
   2. Muda: Waste and inefficiency. (T/F)
   3. Jidoka: A system used for controlling the movement of materials. (T/F)
3. Match the following (C.O.No.4) [Comprehension]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Combination Layout |  | A | Machine Perform Similar operations are grouped at one location |
|  | Fixed Position Layout |  | B | Machines are arranged in the sequence of operations |
|  | Cellular Manufacturing |  | C | Certain Operations are as per sequence and some follow-on process manufacturing |
|  | Process Layout |  | D | Machines and Equipment are moved near the product being manufactured |
|  | Product Layout |  | E | Plant is segmented as per processes |

1. Match the following  (C.O.No.3) [Comprehension]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | Delay |  | A | Charts Used in Motion Study: 5 Types |
| 2 | Storage |  | B | Charts Used in Motion Study: 5 Types |
| 3 | Movement |  | C | Charts Used in Motion Study: 5 Types |
| 4 | Inspection |  | D | Charts Used in Motion Study: 5 Types |
| 5 | Operation |  | E | Charts Used in Motion Study: 5 Types |

1. Determine the Productivity if a machine produced 70 pieces in 5 hours. However, five pieces were unusable. (C.O.No.3) [Analysis]
2. 14 pieces per hourB. 15 pieces per hour
3. 12.5 pieces per hour D. 13 pieces per hour

**Part B [Thought Provoking Questions]**

**Answer all the Questions. (5Qx8M=40M)**

1. The frequency of breakdown of a machine per month is shown in the table. The cost of a break down is $1000 and the cost of preventive maintenance is $1750 per month. If preventive maintenance is performed. The probability of a machine breakdown is negligible. Should the manager use preventive maintenance, or would it be cheaper to repair the machine when it break down?  (C.O. No. 5) [Application]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *No. of Breakdowns per month* | 0 | 1 | 2 | 3 | 4 |
| *Frequency of Occurrence* | 0.05 | 0.20 | 0.20 | 0.30 | 0.20 |

1. A jaggary manufacturer major inputs uses Sugarcane, labour and energy as inputs for the production processes. For year 1, labour costs are Rs. 1,25,000; sugarcane cost Rs. 45,000; and energy costs amount to Rs. 5,500. Labour Costs for Year 2 are Rs. 1,80,000; sugarcane cost Rs. 55,000; and energy costs amount to Rs. 6,000. The factory produced 2000 quintals of jaggery in Year 1 and 3000 quintals of steel plates in the Year 2. 
   1. Calculate productivity for the year 1 & 2
   2. Calculate the productivity growth rate. (C.O. No. 2) [Application]
2. A shop keeper expects to sell approximately 5,600 computer printers of a particular model in the next year. He purchases each printer at Rs. 4,850. Ordering costs are Rs. 1500. Annual Carrying costs are 2% of the price per unit per annum. Working days in a year are 255.
   1. Compute EOQ.
   2. How many orders should the shop keeper place in a year?
   3. What is the length of the order cycle?
   4. What is the average inventory?
   5. What is the total annual cost of the inventory? (C.O. No. 5) [Application]
3. Apple's chief executive officer (CEO) Tim Cook parlayed the 16 years of supply management experience he gained working at IBM and Compaq Computers to entirely revamp Apple's manufacturing process. Starting as Apple's chief operating officer (COO) in 1998, Cook pulled the company out of manufacturing, closing Apple's warehouses and factories around the world. He opted instead to establish just-in-time relationships with independent manufacturing contractors, many of them located in China where labor and cost of goods were much cheaper.

Cook's supply chain improvements reduced the amount of time Apple's inventory sat on the company's balance sheet, which went from months to days. Cook credits these changes as a key factor in Apple's growth and profitability.

* 1. Analyze the case and explain the characteristics of JIT system.
  2. Highlight the benefits and risks of JIT system.

(C.O. No. 6) [Comprehension]

Study the below Gantt Chart prepared as on the end of the day 5 of the production cycle.

(C.O. No. 2) [Application]

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **Process/ Day** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |  | **10** |
| **A** |  |  |  |  |  |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |  |  |  |  |  |
| **E** |  |  |  |  |  |  |  |  |  |  |  |
| **F** |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |

1. Analyze & illustrate your observations for each of the processes.
2. Identify each process as to whether it is in delay or ahead of the planned process. Take decisions appropriately as to how to deal with each of the processes.

**Part C [Problem Solving Questions]**

**Answer all the Questions. (2Qx15M=30M)**

1. The following given data of items are of the inventory of a plant

(C.O. No. 5) [Application]

|  |  |  |
| --- | --- | --- |
| *Item* | *Annual Number of Units Consumed* | *Cost per unit in ($)* |
| A | 2100 | 5 |
| B | 1000 | 5 |
| C | 1600 | 15 |
| D | 5000 | 35 |
| E | 1500 | 1 |
| F | 4000 | 20 |
| G | 8000 | 3 |
| H | 12000 | 5 |
| I | 1500 | 2.5 |
| J | 1000 | 15 |

1. Categorize the items in to ABC categories and draw the ABC Graph.
2. Explain how inventory control to be exercised in ABC categories of materials.
3. A man machine flow chart represents the following data for a process in production

|  |  |  |
| --- | --- | --- |
| *Event* | *Operation* | *Time in minutes* |
| 1 | Man Removes the Rubber Band | 1 |
| 2 | Man Picks up weight from hopper | 3 |
| 3 | Deck is placed in hopper | 5 |
| 4 | Man replaces weight in desk | 7 |
| 5 | Man pushes start button | 9 |
| 6 | Processing | 250 |
| 7 | Man Pushes Stop Button | 9 |
| 8 | Man Picks up desk from output stacker | 20 |
| 9 | Rubber band is replaced on the deck | 23 |

Operator is busy during the events all the events except 6th event. The machine is busy during the events 5 to 7 (both inclusive).

1. Calculate the total Operating Cycle time, Busy and Idle time of both operator and the machine, Percentage of busy & idle time of operator and machine.
2. Assume a shift time is 8 hours, calculate the time in which operator and also machine is working and idle.
3. Write your comments on the utilization of the operator and the machine and give suggestions appropriately. (CO No 3; Application)