

**VPM's**  
**DR VN BRIMS, Thane**  
**Programme: MMS (2022-24)**  
**First Semester Regular Examination March 2023**

<b>Course Name:</b>	Operations Management	<b>Course Code</b>	C104
<b>Roll No.</b>		<b>Marks</b>	<b>60</b>
<b>Total No. of Questions</b>	6	<b>Duration</b>	<b>3 Hours</b>
<b>Total No. of printed pages</b>	3	<b>Date</b>	04.03.2023

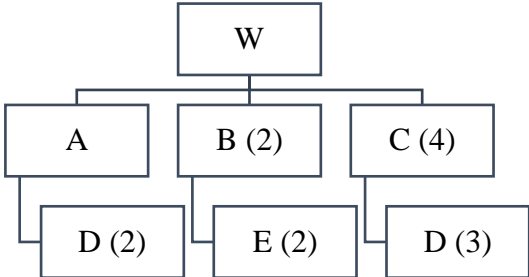
**Course Outcome Statements:**

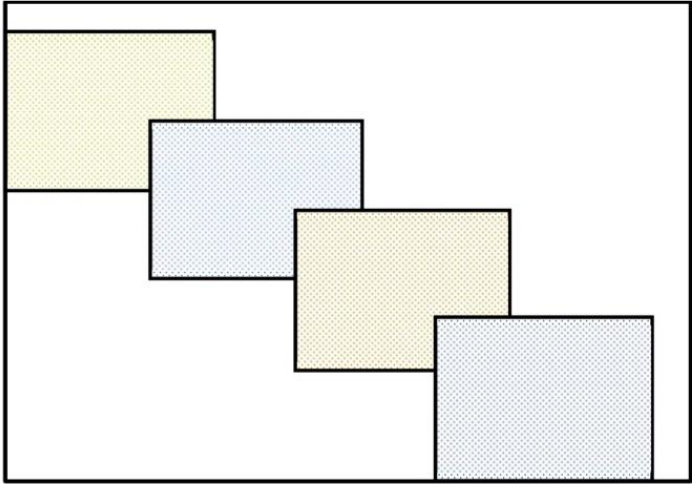
- CO1. RECALL** basic concepts of operations management and cite its evolution  
**CO2. ASSOCIATE** the concepts of operations management and connect with business scenarios  
**CO3. APPLY** basic principles of operations management in production and operation functions  
**CO4. EXAMINE** the problems related to operations management in day-to-day functioning  
**CO5. RECOMMEND** solutions to the problems related to operations management

**Instructions: -**

**Q. No 1** (All Questions are Compulsory)

<b>Q. No.</b>	<b>Questions</b>	<b>Marks</b>	<b>BL</b>	<b>CO</b>
<b>Q. 1</b>	<p style="text-align: center;"><b>Spangler Hoover and Dyson</b></p> <p>In 1907 a janitor called Murray Spangler put together a pillowcase, a fan, an old biscuit tin and a sweeper handle. It was the world's first vacuum cleaner. One year later he sold his patented idea to William Hoover whose company went on to dominate the vacuum cleaner market for decades, especially in its United States homeland. Yet between 2002 and 2005 Hoover's market share dropped from 36 per cent to 13.5 per cent. Why?</p> <p>Because a futuristic-looking and comparatively expensive rival product, the Dyson vacuum cleaner, had jumped from nothing to over 20 per cent of the market. In fact, the Dyson product dates back to 1978 when James Dyson noticed how the air fer in the spray-finishing room of a company where he had been working was constantly clogging with powder particles (just like a vacuum cleaner bag clog with dust). So, he designed and built an industrial cyclone tower, which removed the powder particle by exerting centrifugal forces. The question intriguing him was 'Could the same principle work in a domestic vacuum cleaner?' Five years and five thousand prototypes later he had a working design, since praised for its 'uniqueness and functionality' However, exiting vacuum cleaner manufacturer not as impressed-two rejected the design outright. So, Dyson started making his new design himself. Within a few years Dyson cleaners were in the UK outselling.</p> <p>The rivals that had once rejected them. The aesthetics and functionality of the design help to keep sales growing. In spite of a higher retail price. To Dayson, good is about looking at everyday things with new eyes and working out how they can be made better. Its about challenging existing technology.</p> <p>Dyson engineers have taken this technology one stage further and developed core separator technology to capture even more microscopic dirt. Dirt now goes through three stages of separation. Firstly, dirt is drawn into a powerful outer cyclone. Centrifugal forces throw larger debris, such as pet hair dust particles, into the clear bin at 500 Gs (The maximum G force the human body can take is 8 Gs). Second, a further cyclonic stage, the core separator, removes dust particles as small as 0.5 microns from the. Finally, a cluster of smaller, even faster cyclones generate centrifugal forces of up to 150,000 G – extracting particles as small as mould and bacteria.</p>			

	a.	Analyse the reasons of rejecting Dyson's ideas by major vacuum cleaner manufacturers.	6	Level 4	CO4												
	b.	Evaluate criteria for 'good design' in vacuum cleaner appliance markets.	6	Level 5	CO5												
Q. 2	Answer <b>Any one</b> from the following.																
	a.	Evaluate the following situations and propose the solutions with reference to capacity management 1. If the Demand is slightly more than capacity 2. If the Demand is on the very higher side than capacity.	6	Level 5	CO5												
	b.	Work study can be used to reduce ineffective time, <b>justify</b> to management how work study focusses on ineffective time with an example.	6	Level 5	CO5												
Q. 3	Answer <b>Any one</b> from the following.																
	a.	Examine the product structure tree shows the components needed to assemble one unit of product W. <b>List</b> the quantities of each component needed to assemble 100 units of W. 	6	Level 4	CO4												
	b.	The employee arrives at work. He takes 10 minutes to settle in by hanging up his coat, badging into the time clock and chatting with his co-workers as he walks to his station. For the next hour he completes his work efficiently. He then takes a 15-minute break. He returns to work and works for an hour and a quarter before he takes 30 minutes for lunch. After lunch he attends a training seminar on safety for 30 minutes. Then returns to his station for another 40 minutes. He takes a break for 15 minutes then works for 2 hours before shutting off his machine. He is glad to be done for the day. <b>Analyse</b> the above information and Draw a <b>Process Flow Chart</b> and <b>categorize</b> Value Added activities and non-value-added activities.	6	Level 4	CO4												
Q. 4	Answer <b>Any two</b> from the following.																
	a.	ABC company needs to build a new warehouse to serve 5 plants in the Midwest area. The volume of shipment through each plant is given in the table below: <table border="1" data-bbox="300 1489 1086 1704"> <thead> <tr> <th>Store</th> <th>Volume</th> </tr> </thead> <tbody> <tr> <td>Chicago</td> <td>5,000</td> </tr> <tr> <td>Detroit</td> <td>3,000</td> </tr> <tr> <td>Indianapolis</td> <td>2,000</td> </tr> <tr> <td>Kansas City</td> <td>2,000</td> </tr> <tr> <td>Minneapolis</td> <td>4,000</td> </tr> </tbody> </table> The stores have been positioned on a map. Kansas City is located at the origin of the grid. Its coordinates are (0,0). Chicago is at (16,11) and Detroit at (27,13). Note that the first number is the x-coordinate, while the second one is read on the y-axis. Minneapolis (2,20) Detroit (27,13) Chicago (16,11) Indianapolis (21,4) Kansas City (0,0) Use the center-of-gravity method to compute the optimal location of the warehouse. <b>Apply</b> Center-Of-Gravity Method to determine the x- and y-coordinates of the center of gravity?	Store	Volume	Chicago	5,000	Detroit	3,000	Indianapolis	2,000	Kansas City	2,000	Minneapolis	4,000	6	Level 3	CO3
Store	Volume																
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	b.	ABC Ltd. <b>apply</b> EOQ logic to determine the order quantity for its various components and is planning its orders. The Annual consumption is 80,000 units, Cost to place one order is Rs 1,200, Cost per unit is Rs. 50 and carrying cost is Rs 3.	6	Level 3	CO3												

		<p>i. Determine the economic order quantity (EOQ).</p> <p>ii. How many orders will be placed per year using the EOQ?</p> <p>iii. Determine the ordering, holding, and total inventory costs for the EOQ.</p>																							
	c.	<p>Strong Book Binder has one printing machine, one binding machine, and the manuscripts of a number of different books. Processing times are given in the following table:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Book</th> <th colspan="2">Times in Hours</th> </tr> <tr> <th>Printing</th> <th>Binding</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>5</td> <td>2</td> </tr> <tr> <td>B</td> <td>1</td> <td>6</td> </tr> <tr> <td>C</td> <td>9</td> <td>7</td> </tr> <tr> <td>D</td> <td>3</td> <td>8</td> </tr> <tr> <td>E</td> <td>10</td> <td>4</td> </tr> </tbody> </table> <p><b>Apply</b> Johnson's Rule to determine the order in which books should be processed on the machines, in order to minimize the total time required.</p>	Book	Times in Hours		Printing	Binding	A	5	2	B	1	6	C	9	7	D	3	8	E	10	4	6	Level 3	CO3
Book	Times in Hours																								
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<b>Q. 5</b>		Answer <b>Any two</b> from the following.																							
	a.	 <p style="text-align: center;">Production Variety</p> <p>Looking at the above diagram where x axis represents Production Variety &amp; Y axis represents Production Quantity, <b>relate</b> appropriate production system in four boxes and <b>explain</b> them.</p>	6	Level 2	CO2																				
	b.	<b>Explain</b> the difference between value engineering and value analysis. Which do you believe is most effective at reducing cost of product and why?	6	Level 2	CO2																				
	c.	<b>Explain</b> the component of supply chain and draw a diagram of the supply chain components of your choice.	6	Level 2	CO2																				
<b>Q. 6</b>		Answer <b>Any two</b> from the following.																							
	a.	<b>Define</b> a transformation process familiar to you; <b>list</b> all inputs, components, and the transformation process that produces either a product or service.	6	Level 1	CO1																				
	b.	What are the different parameters on which Service Quality is define?	6	Level 1	CO1																				
	c.	<b>List</b> and briefly <b>define</b> the dimensions of quality for physical goods.	6	Level 1	CO1																				