Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2023

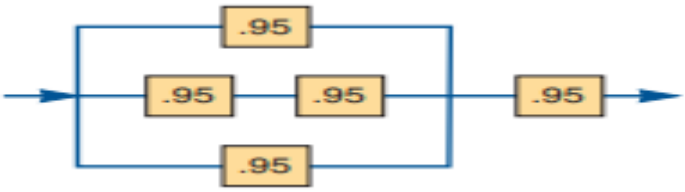
Course: Operations Management **Semester: II**
Program: MBA(PM) **Time : 03 hrs.**
Course Code: LSCM 7001
Max. Marks: 100

Instructions:

SECTION A
10Qx2M=20Marks

S. No.	**Attempt all questions in this section**	**Marks**	**CO**
Q 1	**Explain the following and fill in the blank**		
(a)	Productivity increases when: a) inputs increase while outputs remain the same. b) inputs decrease while outputs remain the same. c) outputs decrease while inputs remain the same. d) inputs and outputs increase proportionately. e) inputs increase at the same rate as outputs.	**2**	**CO1**
(b)	Multifactor productivity: a) remains constant. b) is never constant. c) usually uses substitutes as common variables for the factors of production. d) seldom uses labor as a factor. e) always uses management as a factor.	**2**	**CO1**
(c)	Decision trees use: a) probabilities. b) payoffs. c) logic. d) options. e) all of the above.	**2**	**CO1**
(d)	The process of identifying other organizations that are best at some facet of your operations and then modeling your organization after them is known as: a) continuous improvement. b) employee empowerment. c) benchmarking. d) copycatting. e) patent infringement.	**2**	**CO1**

(e)	The break-even point is: a) adding processes to meet the point of changing product demands. b) improving processes to increase throughput. c) the point in dollars or units at which cost equals revenue. d) adding or removing capacity to meet demand. e) the total cost of a process alternative.	**2**	**CO1**
(f)	Effective capacity is: a) the capacity a firm expects to achieve, given the current operating constraints. b) the percentage of design capacity actually achieved. c) the percentage of capacity actually achieved. d) actual output. e) efficiency.	**2**	**CO1**
(g)	Evaluating location alternatives by comparing their composite (weighted-average) scores involves a) factor-rating analysis. b) cost–volume analysis. c) transportation model analysis. d) linear regression analysis. e) crossover analysis.	**2**	**CO1**
(h)	Scheduling refers to specifying A. The sequence that jobs must be completed B. The due date for each job C. The start and completion times of jobs D. The makespan of each job	**2**	**CO1**
(i)	The Shortest Processing Time (SPT) rule A. Ensures that due dates are met B. Maximizes average flow-time C. Minimizes resource utilization D. Minimizes work in process inventory	**2**	**CO1**
(j)	A requirement of Johnson's two-resource sequencing rule is A. All jobs must begin at the same time B. Jobs must be processed through each work center in the same job sequence C. Only two jobs can be processed at a time through each work center D. Total processing time must be minimized	**2**	**CO1**
SECTION B **4Qx5M= 20 Marks**			
	Attempt all questions, some questions has option, kindly attempt any one from the option		

<table>
<tr><td>Q2</td><td>The Circuit Town store's most popular item is six-packs of 9-volt batteries. About 150 packs are sold per day, following a normal distribution with a standard deviation of 16 packs. Batteries are ordered from an out-of-state distributor; lead time is normally distributed with an average of 5 days and a standard deviation of 1 day. To maintain a 95% service level, what ROP is appropriate?</td><td>5</td><td>CO2</td></tr>
<tr><td>Q3</td><td>What is the overall reliability of the system?
 
</td><td>5</td><td>CO2</td></tr>
<tr><td>Q4</td><td>Esmail Mohebbi, owner of European Ignitions Manufacturing, needs to expand his capacity. He is considering three locations—Athens, Brussels, and Lisbon—for a new plant. The company wishes to find the most economical location for an expected volume of 2,000 units per year. Mohebbi conducts locational cost–volume analysis, given that fixed costs per year at the sites are $30,000, $60,000, and $110,000, respectively; and variable costs are $75 per unit, $45 per unit, and $25 per unit, respectively. The expected selling price of each ignition system produced is $120.</td><td>5</td><td>CO2</td></tr>
<tr><td>Q5</td><td>Discuss the various factors considered for thermal power plant and wind farm location?</td><td>5</td><td>CO2</td></tr>
<tr><td colspan="4">SECTION-C
3Qx10M=30 Marks</td></tr>
<tr><td>Q</td><td>Attempt all questions, some questions has option, kindly attempt any one from the option</td><td></td><td></td></tr>
<tr><td>Q6</td><td>CD players are produced on an automated assembly line process. The standard cost of a CD player is $150 per unit (labor, $30; materials, $70; and overhead, $50). The sales price is $300 per unit.
A. To achieve a 10 percent TFP improvement by reducing material costs only, by what percent must these costs be reduced.
B. To achieve a 10 percent TFP improvement by reducing labor costs only, by what percent must these costs be reduced.
C. To achieve a 10 percent MFP improvement by reducing Overhead costs only, by what percent must these costs be reduced</td><td>10</td><td>CO3</td></tr>
<tr><td>Q7</td><td>Generate a production plan with varying inventory levels using the given information
Opening inventory: 500 units
Inventory holding cost: Rs 40
Worker productivity: 20 units per day
Worker strength: 10
Shortage cost: Rs 30 per unit
<table><tr><td></td><td>June</td><td>July</td><td>August</td><td>September</td></tr></table></td><td>10</td><td>CO3</td></tr>
</table>

	Demand	5000	4600	5200	4800		
	Working days	23	24	22	23		
Q8	A company is setting up an assembly line to produce 192 units per 8-hour shift. The following table identifies the work elements, times, and immediate predecessors: **Work Element** / **Time(sec)** / **Immediate Predecessor** A / 40 / None B / 80 / A C / 30 / D, E, F D / 25 / B E / 20 / B F / 15 / B G / 120 / A H / 145 / G I / 130 / H J / 115 / C,I 1. Draw a precedence diagram 2. What is the desired cycle time (in seconds)? 3. What is the theoretical minimum number of stations? Assign tasks to each workstation 4. Compute the efficiency					**10**	**CO3**
	SECTION-D **2Qx15M= 30 Marks**						
	Attempt all questions, some questions has option, kindly attempt any one from the option						
Q9	King electronics wants to launch new line of monitors. It has two design options **Design A:** Probability to yield 60 good monitors per 100 is .9 Probability to yield 65 good monitors per 100 is .1 Cost for Design A is Rs. 1000,000 **Design B:** Probability to yield 64 good monitors per 100 is .80 Probability to yield 59 good monitors per 100 is .20 Cost for Design B is Rs. 135,0000 - Production run in both the cases is 100000 units - Each monitor good or bad will cost Rs 75 per unit for manufacturing and will be sold for Rs 150 per unit - Bad monitors will be destroyed and disposal cost is ignored Use Decision Tree analysis to help King electronics choose the best design					**15**	**CO4**

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<tr>
<td>Q10</td>
<td>Apply the three popular sequencing rules (i) FCFS (ii) SPT and (iii) EDD to these five jobs mentioned below and what interpretation you can draw from the results
<table>
<tr><th>Job</th><th>Job work(Processing) time (Days)</th><th>Job Due Date(Days)</th></tr>
<tr><td>A</td><td>6</td><td>8</td></tr>
<tr><td>B</td><td>2</td><td>6</td></tr>
<tr><td>C</td><td>8</td><td>18</td></tr>
<tr><td>D</td><td>3</td><td>15</td></tr>
<tr><td>E</td><td>9</td><td>23</td></tr>
</table>
</td>
<td>15</td>
<td>CO4</td>
</tr>
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