Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Operations Management **Semester: I**
Program: All MBA **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		

Q2	The Circuit Town store in sells about 10 digital cameras a day (almost a constant quantity). Lead time for camera delivery is normally distributed with a mean time of 6 days and a standard deviation of 1 day. A 98% service level is set. Find the ROP.	**5**	**CO2**
Q3	What are the various factors that determine the service location strategy? **OR** Differentiate between level output plan and chase plan. Which plan would be preferable if a. Cost of inventory holding is very high b. Cost of production rate change is very high	**5**	**CO2**
Q4	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.	**5**	**CO2**
Q5	Discuss the various types of layout with examples?	**5**	**CO2**
SECTION-C **3Qx10M=30 Marks**			
Q	**Attempt all questions, some questions has option, kindly attempt any one from the option**		
Q6	Alyssa's Custom Cakes currently sells 5 Birthday, 2 Wedding and 3 Specialty Cakes each month for $50, $150 and $100 each respectively. It takes 90 minutes to produce a birthday cake, 240 minutes to produce a wedding cake and 60 minutes to produce specialty cakes. Alyssa's current TFP is 1.25 A. Assuming each cake costs the same to make, what is the average cost to produce a cake B. Calculate Alyssa's labor productivity ratio in dollars per hour for each type of cake C. Based solely on the labor productivity ratio, which cake should Alyssa try to sell the most D. Based on your answer in part (a), is there a type of cake Alyssa should stop selling **OR** Calculate economic order quantity (EOQ) for the following data	**10**	**CO3**

	Monthly demand 1500 units Cost of component Rs. 1.20 per piece Ordering cost Rs. 50 per order Inventory carrying cost 6% per year		
Q7	In a manufacturing firm, a worker can make 3 units of a product daily. Hiring cost: Rs 3000 Layoff cost: Rs 4000 Current employee strength: 40 Aggregate demand is as follows: **June** | **July** | **August** | **September** **Demand** | 3170 | 3000 | 2900 | 2660 **Working Days** | 24 | 25 | 23 | 24 Generate a production plan by following varying workforce level strategy.	**10**	**CO3**
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: **Task** | **Task Time (Sec)** | **Immediate Predecessor** A | 40 | A B | 80 | D,E,F C | 30 | B D | 25 | B E | 20 | B F | 15 | A G | 120 | G H | 145 | H I | 130 | C J | 115 | 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		

<table>
<tr>
<td>Q9</td>
<td>
King electronics wants to launch new line of monitors. It has two design options
<u>Design A:</u> 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
<u>Design B:</u> 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

OR

Consider the following payoff table

<table>
<tr><td rowspan="2">Alternative</td><td colspan="4">Future Conditions</td></tr>
<tr><td>Low</td><td>Moderate</td><td>High</td><td>Very high</td></tr>
<tr><td>A</td><td>100</td><td>100</td><td>100</td><td>100</td></tr>
<tr><td>B</td><td>90</td><td>130</td><td>150</td><td>140</td></tr>
<tr><td>C</td><td>(-100)</td><td>150</td><td>300</td><td>160</td></tr>
</table>

Which alternative is preferable on the basis of

a. Maximin
b. Maximax
c. Minimax regret
</td>
<td>15</td>
<td>CO4</td>
</tr>
<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>
</table>
</td>
<td>15</td>
<td>CO4</td>
</tr>
</table>

A	6	8
B	2	6
C	8	18
D	3	15
E	9	23

OR

Uber Technologies, Inc.

The $41 billion dollar firm Uber Technology, Inc., is unsettling the traditional taxi business. In over 40 countries and 240 markets around the world, Uber and similar companies are challenging the existing taxi business model. Uber and its growing list of competitors, Lyft, Sidecar, and Flywheel in America, and fledging rivals in Europe, Asia, and India, think their smart phone apps can provide a new and improved way to call a taxi. This disruptive business model uses an app to arrange rides between riders and cars, theoretically a nearby car, which is tracked by the app. The Uber system also provides a history of rides, routes, and fees as well as automatic billing. In addition, driver and rider are also allowed to evaluate each other. The services are increasingly popular, worrying established taxi services in cities from New York to Berlin, and from Rio de Janeiro to Bangkok. In many markets, Uber has proven to be the best, fastest, and most reliable way to find a ride. Consumers worldwide are endorsing the system as a replacement for the usual taxi ride. As the most established competitor in the field, Uber is putting more cars on the road, meaning faster pickup times, which should attract even more riders, which in turn attracts even more drivers, and so on. This growth cycle may speed the demise of the existing taxi businesses as well as provide substantial competition for firms with a technology-oriented model similar to Uber's. The Uber business model initially attempts to bypass a number of regulations and at the same time offer better service and lower fees than traditional taxis. However, the traditional taxi industry is fighting back, and regulations are mounting. The regulations vary by country and city, but increasingly special licensing, testing, and inspections are being imposed. Part of the fee charged to riders does not go to the driver, but to Uber, as there are real overhead costs. Uber's costs, depending on the locale, may include insurance, background checks for drivers, vetting of vehicles, software development and maintenance, and centralized billing. How these overhead costs compare to traditional taxi costs is yet to be determined.

	Therefore, improved efficiency may not be immediately obvious, and contract provisions are significant. In addition to growing regulations, a complicating factor in the model is finding volunteer drivers at inopportune times. A sober driver and a clean car at 1:00 a.m. New Year's Eve does cost more. Consequently, Uber has introduced "surge" pricing. Surge pricing means a higher price, sometimes much higher, than normal. Surge pricing has proven necessary to ensure that cars and drivers are available at unusual times. These higher surge prices can be a shock to riders, making the "surge price" a contentious issue. **Discussion Questions** 1. The market has decided that Uber and its immediate competitors are adding efficiency to our society. How is Uber providing that added efficiency? 2. Do you think the Uber model will work in the trucking industry? 3. In what other areas/industries might the Uber model be used		