

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Course: Operations Management

Semester: I

Program: MBA-AVM, PSM, Core (HR/Marketing/Finance/Operations)

CC: LSCM 7001

Time: 03 Hrs.

Max. Marks: 100

Instructions: Answer all parts of a question in one place. Attend all sections.

SECTION A

S. No.		Marks	CO
Q 1	Answer <u>all</u> questions of this section.	20	1,2,3,4
(i)	In _____ type of production, the products/services follow direct linear paths without backtracking or sidetracking. [Fill in the blank.]	1	1
(ii)	_____ layout is suitable for production of various non-standard products in small quantities. [Fill in the blank.]	1	2
(iii)	_____ layout is preferred by a firm manufacturing very large or bulky products? [Fill in the blank.]	1	2
(iv)	When we talk about Capacity Flexibility, it means the flexibility of _____. [Plants/ Processes/ Workers/ All the above/ None of the above] [Select right option.]	1	2
(v)	MRP stands for: _____. [Fill in the blank.]	1	3
(vi)	MPS stands for: _____. [Fill in the blank.]	1	3
(vii)	Write the equation for EOQ and specify the components of it.	2	3
(viii)	The final form of listing of all raw materials, parts, sub-assemblies, and assemblies that go into an end item is a _____. [Fill in the blank.]	1	3
(ix)	_____ is a chain of critical activities determining the duration of a project. [Fill in the blank.]	1	2
(x)	TPM stands for: _____. [Fill in the blank.]	1	4
(xi)	QFD stands for: _____. [Fill in the blank.]	1	4
(xii)	What is group technology? [Answer in 2-3 lines.]	2	1
(xiii)	CRAFT is a computerized technique for layout planning/location planning/ capacity planning/ forecasting. [Select the right alternative.]	1	2
(xiv)	Mention at least three wastes as are listed by TOYOTA's lean approach.	3	4
(xv)	During a particular week, the production of a plant was 80 units. If, its historic highest or best utilization recorded was 120 units per week. What is this plant's capacity utilization in the given week?	2	2

SECTION B

Q	Answer <u>any four</u> questions in short.	20																			
(i)	<p>The suitable location of a cement plant is being identified. The prospective plant would receive raw materials from three lime stone mines. The coordinates and expected load transfer from the three mines M1, M2 and M3 are as under. Suggest the ideal plant (location).</p> <table border="1"> <thead> <tr> <th>Mine Location</th> <th>Load</th> <th>Transportation cost per unit load per unit distance</th> </tr> </thead> <tbody> <tr> <td>M1 (20,10)</td> <td>22</td> <td>10</td> </tr> <tr> <td>M2 (10,40)</td> <td>43</td> <td>10</td> </tr> <tr> <td>M3 (40,20)</td> <td>36</td> <td>10</td> </tr> </tbody> </table>	Mine Location	Load	Transportation cost per unit load per unit distance	M1 (20,10)	22	10	M2 (10,40)	43	10	M3 (40,20)	36	10	5	2						
Mine Location	Load	Transportation cost per unit load per unit distance																			
M1 (20,10)	22	10																			
M2 (10,40)	43	10																			
M3 (40,20)	36	10																			
(ii)	What type of layout is preferably adopted in a garment manufacturing factory and why?	5	2																		
(iii)	Discuss the various elements of inventory cost and their tradeoff for economic consideration.	5	3																		
(iv)	<p>The monthly demand for the units manufactured are as follows</p> <table border="1"> <thead> <tr> <th>Month</th> <th>Jan</th> <th>Feb</th> <th>Mar</th> <th>Apr</th> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> </tr> </thead> <tbody> <tr> <td>Units</td> <td>100</td> <td>80</td> <td>110</td> <td>115</td> <td>105</td> <td>110</td> <td>125</td> <td>120</td> </tr> </tbody> </table> <p>Forecast demand for January based on -</p> <p>a) Simple average b) 3 month moving average c) 3 month weighted moving average (weights being 0.5, 0.3 & 0.2)</p>	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Units	100	80	110	115	105	110	125	120	5	3
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug													
Units	100	80	110	115	105	110	125	120													
(v)	Discuss the various cost elements of quality.	5	4																		

SECTION-C

Q	Answers with description and/or analysis, <u>any three</u> questions	30													
(i)	Describe the functions of materials management in detailed.	10													
(ii)	<p>Answer both parts of the question:</p> <p>a) Three production processes, P1, P2 and P3 have the following cost structure (see table). Analyze and identify the cost efficient process for producing 8,000 units?</p> <table border="1"> <thead> <tr> <th>Process</th> <th>Fixed Cost per year (in \$)</th> <th>Variable cost per unit (in \$)</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>120,000</td> <td>3.00</td> </tr> <tr> <td>P2</td> <td>90,000</td> <td>4.00</td> </tr> <tr> <td>P3</td> <td>80,000</td> <td>4.50</td> </tr> </tbody> </table> <p>b) Write the mathematical expressions for calculating the standard time and its elements. An automobile service center takes 12 vehicles sequentially in hand on an average day. The average testing and maintenance servicing time per vehicle is 30 minutes. If, one hour personal allowance is given on an average 8 hours-day. Calculate the % of process allowance adopted in the organization.</p>	Process	Fixed Cost per year (in \$)	Variable cost per unit (in \$)	P1	120,000	3.00	P2	90,000	4.00	P3	80,000	4.50	10	2
Process	Fixed Cost per year (in \$)	Variable cost per unit (in \$)													
P1	120,000	3.00													
P2	90,000	4.00													
P3	80,000	4.50													

(iii)	Describe different types of production and their suitable layouts.	10	2																																				
(iv)	<p>A company manufactures seasonal products. The information regarding the seasonal demand pattern, available production capacities during regular time, overtime and other details are as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Available Production Capacity (units)</th> <th colspan="2" style="text-align: center;">Demand Forecast</th> </tr> <tr> <th style="border: 1px solid black;">Period</th> <th style="border: 1px solid black;">RT</th> <th style="border: 1px solid black;">OT</th> <th style="border: 1px solid black;">SC</th> <th style="border: 1px solid black;">Period</th> <th style="border: 1px solid black;">Demand</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid black;">1</td> <td style="border: 1px solid black;">900</td> <td style="border: 1px solid black;">350</td> <td style="border: 1px solid black;">600</td> <td style="border: 1px solid black;">1</td> <td style="border: 1px solid black;">700</td> </tr> <tr> <td style="border: 1px solid black;">2</td> <td style="border: 1px solid black;">1000</td> <td style="border: 1px solid black;">350</td> <td style="border: 1px solid black;">600</td> <td style="border: 1px solid black;">2</td> <td style="border: 1px solid black;">1000</td> </tr> <tr> <td style="border: 1px solid black;">3</td> <td style="border: 1px solid black;">1100</td> <td style="border: 1px solid black;">350</td> <td style="border: 1px solid black;">600</td> <td style="border: 1px solid black;">3</td> <td style="border: 1px solid black;">2000</td> </tr> <tr> <td style="border: 1px solid black;">4</td> <td style="border: 1px solid black;">700</td> <td style="border: 1px solid black;">350</td> <td style="border: 1px solid black;">600</td> <td style="border: 1px solid black;">4</td> <td style="border: 1px solid black;">1200</td> </tr> </tbody> </table> <p>Other relevant data can be summarized as following:</p> <ul style="list-style-type: none"> • Initial inventory = 200 units • Final inventory = 25 units • Regular time prodn. cost/ unit = Rs.125/- • Over time prodn. cost/unit = Rs.150/- • Subcontracting cost/unit = Rs.175/- • Inventory Carrying cost/unit/period = Rs.25/- <p>Develop an aggregate capacity plan. [Mention the assumptions, if taken anywhere]</p>	Available Production Capacity (units)				Demand Forecast		Period	RT	OT	SC	Period	Demand	1	900	350	600	1	700	2	1000	350	600	2	1000	3	1100	350	600	3	2000	4	700	350	600	4	1200	10	2
Available Production Capacity (units)				Demand Forecast																																			
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2	1000	350	600	2	1000																																		
3	1100	350	600	3	2000																																		
4	700	350	600	4	1200																																		
(v)	<p>Answer both parts of the question</p> <p>a) In the following process map, the five boxes indicate the 5-stages of a production system. Respective processing times (in minutes) are mentioned below the boxes.</p> <div style="text-align: center;"> <pre> graph LR Start(()) --> P1[P1] P1 --> P2[P2] P2 --> P3[P3] P3 --> P4[P4] P4 --> P5[P5] P5 --> End(()) </pre> </div> <ol style="list-style-type: none"> 1) What is the cycle time in this production system? 2) What is the flow time of this production system? 3) Identify the bottleneck(s) and mention the impact on adjacent processes. <p>b) Calculate the system availability, if in an equipment service system the service provider is capable of maintaining the ‘mean time between failures (MTBF)’ of 36 hrs. and ‘mean time to repair (MTTR)’ of 2 hrs.</p>	10	2																																				

SECTION-D

Q Answer the case questions with a thorough reading and analysis.

Short case Tea and Sympathy[®]

Defining quality in terms of perception and expectation can sometimes reveal some surprising results. For example, Tea and Sympathy is a British restaurant and café in the heart of New York's West Village. Over the last ten years it has become a fashionable landmark in a city with one of the broadest range of restaurants in the world. Yet it is tiny, around a dozen tables packed into an area little bigger than the average British sitting room. Not only expatriate Brits but also native New Yorkers and celebrities queue to get in. As the only British restaurant in New York, it has a novelty factor, but also it has become famous for the unusual nature of its service. *'Everyone is treated in the same way,'* says Nicky Perry, one of the two ex-Londoners who run it. *'We have a firm policy that we don't take any shit.'* This robust attitude to the treatment of customers is reinforced by 'Nicky's Rules' which are printed on the menu.

- 1 Be pleasant to the waitresses – remember Tea and Sympathy girls are always right.
- 2 You will have to wait outside the restaurant until your entire party is present: no exceptions.
- 3 Occasionally, you may be asked to change tables so that we can accommodate all of you.
- 4 If we don't need the table you may stay all day, but if people are waiting it's time to naff off.
- 5 These rules are strictly enforced. Any argument will incur Nicky's wrath. You have been warned.

Most of the waitresses are also British and enforce Nicky's Rules strictly. If customers object they are thrown out.



Source: © Peter Casachy/Getty Images/Digital Vision

Nicky says that she has had to train 'her girls' to toughen up. *'I've taught them that when people cross the line they can tear their throats out as far as I'm concerned. What we've discovered over the years is that if you are really sweet, people see it as a weakness. People get thrown out of the restaurant about twice a week and yet customers still queue for the genuine shepherds pie, a real cup of tea and, of course, the service.'*

Questions

- 1 Why do you think 'Nicky's Rules' help to make the Tea and Sympathy operation more efficient?
- 2 The restaurant's approach to quality of service seems very different to most restaurants. Why do you think it seems to work here?

**15x2=
30**

1,2,3,4

[Source: Nigel Slack, Stuart Chambers and Robert Johnston, *Operations Management, Ed. 2007*, Fifth Edition, Pearson Education Limited, p. 541.]