(b) Determine the minimum and maximum cycle time in seconds.
(c) What range of output is theoretically possible for the line?
(d) What is the minimum number of work station needed for a desired output of 300 units?
(e) What output potential will result if the cycle time is
(a) 90 sec (b) 120 sec

OR iii. Consider four jobs A, B, C and D which have to be processed on three machines M_1, M_2 and M_3. The processing time for each job on each of the three machines are given in the table. **7**

	Processing Time (Hours) on machines		
Job	M_1	M_2	M_3
A	12	6	10
B	6	4	8
C	7	5	6
D	8	3	7

Using Johnson's rule, find the optimal sequence., total cycle time, total operating time, and total idle time, % utilization.

Q.6 Attempt any two:

i. Define Benchmarking. What are the various types of benchmarking? Describe briefly? **5**

ii. Define acceptance sampling. Draw the operating characteristics curve for single sampling plan and describe each of following. **5**
(a) AOQ (b) LTPD
(c) Consumer's risk (d) Producer's risk

iii. Define TQM. What are the obstacles to implement the TQM? **5**

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Enrollment No.....

Faculty of Management Studies

End Sem (Even) Examination May-2019

MS5CO10 Operations Management

Programme: MBA Branch/Specialisation: Management

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Customer producers' interface in make to order strategy is: **1**
(a) High at sales and design level (b) Limited
(c) Moderate at sales level (d) None of these

ii. If the output increases the productivity: **1**
(a) Increases (b) Remains same (c) Decreases (d) Any of these

iii. Bringing engineering design and manufacturing personnel together early in the design phase is known as: **1**
(a) Reverse Engineering (b) Remanufacturing
(c) Concurrent Engineering (d) None of these

iv. The following type of layout is preferred for low volume production of nonstandard products **1**
(a) Product layout (b) Process layout
(c) Fixed layout (d) None of these

v. Delphi method is used for: **1**
(a) Judgmental forecast (b) Time series forecast
(c) Associative model (d) All of these

vi. Which of the following is NOT a capacity option of aggregate planning? **1**
(a) Varying production rates through overtime or idle time
(b) Changing inventory levels
(c) Subcontracting
(d) Back ordering during high-demand periods

vii. Compute the required cycle time for a process that operates 8 hours daily with a required output of 300 units per day. **1**
(a) 0.625min (b) 3.75 min (c) 1.6 min (d) 2 min

viii. A possible disadvantage of the SPT priority rule is that it **1**
(a) It ignores processing times.
(b) It tends to make jobs with long processing times wait
(c) It upsets first-come-first served processing
(d) None of these.

ix. The process of measuring performance against the best in the same or another industry is called: **1**
(a) Benchmarking (b) Six sigma
(c) Kaizen (d) None of these

x. A time ordered plot of sample statistics, used to distinguish between random and non-random variability is termed as: **1**
(a) Pareto chart (b) Control chart
(c) Histogram (d) Cause and effect diagram

Q.2 i. Define productivity? List the various types of productivity and techniques to improve productivity? **4**

ii. Give the comparison between Make to stock, make to order and Assemble to order. **6**

OR iii. Briefly discuss each of these terms related to the historical evolution of operations management. **6**
(a) Industrial revolution (b) Scientific management
(c) Japanese Influence

Q.3 i. What are the objective of a good plant layout? **4**

ii. What are the advantages and disadvantages of process layout? **6**

OR iii. Five departments are to be assigned to locations B–F in the grid. (For technical reasons, department 6 must be assigned to location A) Transportation cost is Rs. 2 per foot. The objective is to minimize total transportation cost. Information on interdepartmental work flows and distances between locations is shown in the following tables. **6**

DISTANCE BETWEEN LOCATIONS (FEET)

From \ To	A	B	C	D	E	F
A	—	50	100	50	80	130
B		—	50	90	40	70
C			—	140	60	50
D				—	50	120
E					—	50
F						—

NUMBER OF TRIPS PER DAY BETWEEN CENTERS

From \ To	1	2	3	4	5	6
1	—	125	62	64	25	50
2		—	10	17	26	54
3			—	2	0	20
4				—	13	2
5					—	5
6						—

Q.4 i. What are the advantages and limitations of MRP? **4**

ii. Define Aggregate production planning. List the various strategies of aggregate planning. Describe various option of reactive strategy to match the demand of market. **6**

OR iii. Forecasts based on averages. Given the following data: **6**

Period	Number of complaints
1	60
2	65
3	55
4	58
5	64

Prepare a forecast for period 6 using each of these approaches:
(a) The appropriate naive approach.
(b) A three-period moving average.
(c) A weighted average using weights of 0.50 (most recent),0.30, and 0.20.
(d) Exponential smoothing with a smoothing constant of 0.40.

Q.5 i. Define following terms: **3**
(a) Line balancing (b) Cycle time (c) Precedence diagram

ii. For the set of tasks given below, do the following: **7**

Task	A	B	C	D	E	F	G	H	I	J
Task Time (seconds)	45	11	9	50	26	11	12	10	9	10
Immediate Predecessor	-	A	B	-	D	E	C	C	F, G, H	I

Assume the 7 hrs work day
(a) Develop the precedence diagram

Marking Scheme
MS5CO10 Operations Management

Q.1 i. Customer producers' interface in make to order strategy is: **1**
(a) High at sales and design level

ii. If the output increases the productivity: **1**
(d) Any of these

iii. Bringing engineering design and manufacturing personnel together early in the design phase is known as: **1**
(c) Concurrent Engineering

iv. The following type of layout is preferred for low volume production of nonstandard products **1**
(b) Process layout

v. Delphi method is used for: **1**
(a) Judgmental forecast

vi. Which of the following is NOT a capacity option of aggregate planning? **1**
(d) Back ordering during high-demand periods

vii. Compute the required cycle time for a process that operates 8 hours daily with a required output of 300 units per day. **1**
(c) 1.6 min

viii. A possible disadvantage of the SPT priority rule is that it **1**
(b) It tends to make jobs with long processing times wait

ix. The process of measuring performance against the best in the same or another industry is called: **1**
(a) Benchmarking

x. A time ordered plot of sample statistics, used to distinguish between random and non-random variability is termed as: **1**
(b) Control chart

Q.2 i. Definition of productivity 1 mark **4**
Types of productivity 1 mark
Techniques to improve productivity 2 marks

ii. Comparison between Make to stock, make to order and Assemble to order. **6**
6 points 1 mark for each point (1 mark * 6)

OR iii. Discuss terms related to the historical evolution of operations management. **6**
(a) Industrial revolution 2 marks
(b) Scientific management 2 marks
(c) Japanese Influence 2 marks

Q.3 i. Objective of a good plant layout **4**
1 mark for each objective (1 mark * 4)

ii. Any six advantages **6**
0.5 mark for each point (0.5 mark * 6) 3 marks
Any six disadvantages of process layout
0.5 mark for each point (0.5 mark * 6) 3 marks

OR iii. To minimize total transportation cost. **6**
Arranging the data (Distances in increasing order and trips in decreasing order) 2 marks
Assigning the centres to the location 2 marks
Calculating the total transportation cost 2 marks

Q.4 i. Any four advantages **4**
0.5 mark for each point (0.5 mark * 4) 2 marks
Any four limitations of MRP
0.5 mark for each point (0.5 mark * 4) 2 marks

ii. Definition of Aggregate production planning 1 mark **6**
Types of strategies of aggregate planning 1 mark
Option of reactive strategy to match the demand of market.
Description of any 4 options
1 mark for each (1 mark * 4) 4 marks

OR iii. Prepare a forecast for period 6 using each of these approaches: **6**
(a) The appropriate naive approach. 1 mark
(b) A three-period moving average. 1 mark
(c) A weighted average using weights of 0.50 (most recent),0.30, and 0.20. 1 mark
(d) Exponential smoothing with a smoothing constant of 0.40. 3 marks

Q.5 i. Define following terms: **3**
(a) Line balancing 1 mark
(b) Cycle time 1 mark
(c) Precedence diagram 1 mark

ii. Precedence diagram 2 marks **7**
Minimum and maximum cycle time 1 mark
Range of output 1 mark
Minimum number of work station 2 marks
Output for cycle time 1 mark

iii.	Condition satisfy		1 mark	**7**
	Converting n job 3 machine to n job 2 machine problem			
			1 mark	
	Sequencing of jobs according to Johnson's rule		1 mark	
	Preparing Gantt chart or tabular form of start and end time on machines			
			2 marks	
	Calculating cycle time, total operating time and total idle time			
			1 mark	
	Calculating % utilization (efficiency of utilization)		1 mark	
Q.6	Attempt any two:			
i.	Defining Benchmarking		1 mark	**5**
	4 types of Benchmarking			
	1 mark for each (1 mark * 4)		4 marks	
ii.	Define acceptance sampling		1 mark	**5**
	Drawing of operating characteristics curve and describing each			
	1 mark for each (1 mark * 4)		4 marks	
iii.	Defining TQM		2 marks	**5**
	Six obstacles to implement the TQM			
	0.5 mark for each point (0.5 mark * 6)		3 marks	

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