GUJARAT TECHNOLOGICAL UNIVERSITY BE: SEMESTER VIII – EXAMINATION: SUMMER 2015

Su	bject	Code: 182501 Date: 15/05/2	2015
Su Ti Ins	bject me: 1 struction 1. 2. 3.	Name: Production and Operations Management 0.30am-01.00pm Total Marks ns: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	s: 70
Q.1	(a)	Define: Production and Operations Management (POM) and Production System	m 07
	(b)	 (PS) by giving appropriate illustrations. Identify the basic inputs, Conversion Media and Outputs for the followin production Systems. i) Oil Refinery ii) Hospital iii) University /College 	ıg 07
Q.2	(a)	Define and Differentiate between Production Planning and Process Planning b giving example in each case	oy 07
	(b)	Define work piece control. Define and explain Dimensional and Tolerance analyses in brief.	ce 07
		OR	
	(b)	What is scheduling? State and define scheduling rules in brief. Justify the Johnson's rule for sequencing n-jobs to be processed on tw machines A &B in the technological ordering "AB".	07
Q.3	(a)	What is forecasting? Distinguish forecast from the broader concept of prediction. List the types of forecast errors measures used.	of 04
	(b)	Room Registration in the hotel Aaram has been recorded for the past 9 years. I	in 10

(b) Room Registration in the hotel Aaram has been recorded for the past 9 years. In order to project future occupancy, management would like to determine the mathematical trend of customer registration. The estimate would help the hotel management whether future expansion will be needed. Given the following time-series data, develop a regression equation relating registrations to time. Then forecast 2014 and 2015 registrations.

Koom registrations are in thousands.									
Sr. No.	1	2	3	4	5	6	7	8	9
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
Customer	17	16	16	21	20	20	23	25	24

Room registrations are in thousands:

OR

- Q.3 (a) Define and describe aggregate planning. Distinguish between Matching Capacity 04 and Level Capacity aggregate plans
 - (b) A bowing ball manufacturer is considering two capacity plans for next year: 10 Level capacity with inventory and matching demand.

The quarter	ly aggregate	demand is	s shown	below	for the	e two	plans.
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Quarter	1	2	3	4
Aggregate Demand	14,500	22,800	34,600	30,200

The labor standard is 1.6 hours per bowling ball, hiring cost is Rs.600 per worker hired, layoff cost is Rs.400 per worker laid off, carrying cost for finished goods is Rs. 5 per bowling ball per year, there is no beginning inventory for the previous for the first quarter, 83 workers are employed at the end of the fourth quarter of the previous year, and the company produces bowling balls 8 hours per day, 62 days per quarter.

Based on the information given, which capacity plan would you recommend? Assume that the quarterly demand pattern repeats from year to year.

- Q.4 (a) What is objective of break even analysis? What are the assumptions of break 04 even analysis?
 - (b) The two machines produce a specific part in batches. The set up cost per batch 10 and the variable unit production cost are:

Cost in rupees					
Semi-Automatic Machine	Automatic Machine				
Set up cost per batch : 20.00	: 50.00				
Unit Variable Cost : 0.60	: 0.40				

The statement of the problem tells us that there are two alternatives: Buy an automatic machine or Buy a semi-automatic machine.

- i) Draw Break Even Chart and find Break Even Quantity and Suggest economic alternative for this case.
- ii) When the hourly production rates for automatic and semi-automatic machines are 25 and 15 units, respectively and factory operates 8 hour single shift basis. Draw Break Even Chart and find Break Even Quantity and Suggest economic alternative for this case.

OR

- Q.4 (a) State the importance of balancing lines and overall procedural steps for line 02 balancing.
 - (b) The preinduction physical examination given by the Indian Army involves the following seven activities:

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Sr.	Activity	Average Time
No.		(Minutes)
1	Medical History	10
2	Blood Tests	8
3	Eye Examination	5
4	Measurements (i.e., weight, height, blood pressure)	7
5	Medical Examination	16
6	Psychological interview	12
7	Exit Medical Evaluation	10

These activities can be performed in any order, with two exceptions: Medical history must be taken first, and exit medical evaluation is last. At present, there are three paramedics and two physicians on duty during each shift. Only physicians can perform exit evaluations and conduct psychological interviews. Other activities can be carried out by either physicians or paramedics.

Your tasks are:

- i) Develop a layout and balance the line.
- ii) How many people can be processed per hour?
- iii) Which activity accounts for the current bottleneck?
- iv) If one more physician and one paramedic can be placed on duty, how would you redraw the layout? What is the new throughput?
- Q.5 (a) State the importance and objectives of material management. Explain: vendor 04 development and selection.
 - (b) The Milk and Food Products Limited sells a variety of milk shakes in bottles. On an average, every year, 4000 new bottles are purchased to replace the broken and damaged ones. The carrying cost of bottles in the inventory is 50%, and the cost of placing an order is Rs.40.00. The supplier has quoted the following discount prices for the bottles.

Sr.	Size of Order	Price per bottle (Rs.)
1.	Below 500	0.75
2.	501 to 1000	0.72
3.	1001 to 2000	0.70
4.	Over 2000	0.69

Keeping in mind the attractive discount prices offered by the supplier, what quantity should be ordered each time? Why?

OR

- Q.5 (a) Define: Perpetual Inventory, Periodic inventory, Lead time, Concepts of safety 04 stock and service level in probabilistic inventory models.
 - (b) Determine size of safety stock, reorder point in case of Fixed order Quantity 10
 Variable cycle Policy with the following information:

5 5	e
Annual demand	= 24,000 units
Economic Order Quantity	= 2000 units
Average daily consumption	= 60 units
Standard deviation	= 24
Lead Time	= 15 days
Show Fixed Order Quantity	-Variable Cycle Policy graphically.
