Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VIII.EXAMINATION – WINTER 2016

Subject Code: 182501   **Date: 22/10/2016**
Subject Name: Production and Operations Management
Time: 02:30 PM to 05:00 PM   **Total Marks: 70**
Instructions:
   1. **Attempt all questions.**
   2. **Make suitable assumptions wherever necessary.**
   3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What are the objectives of production, planning and control?	**07**
	(b)	Explain 3-2-1 concept of location for work-piece control. Also describe geometric control and mechanical control used for work-piece control.	**07**
Q.2	**(a)**	Explain the following terms with respect to inventory control (i) Lead time (ii) Safety stock (iii) ROL (iv) MPS(v) BOM	**07**
	(b)	A manufacture has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying amounts Rs 1.2 unit per annum. The set up cost per run Rs. 80 find	**07**

           (1) Economic order quantity
           (2) Optimum number of orders per annum.
           (3) Average annual inventory cost (Minimum)
           (4) Optimum period of supply per optimum order.

OR

	(b)	Give Definition of Material requirement planning. Write any THREE objectives and function served by MRP.	**07**
Q.3	**(a)**	The following data gives the sales of the company for various years. Fit the straight line. Forecast the sales for the year 2015 and 2016.	**07**

Year	Sales (000)
2006	13
2007	20
2008	20
2009	28
2010	30
2011	32
2012	33
2013	38
2014	43

	(b)	What is time series analysis? What are the components of time series? How the forecast is made from the time series.	**07**

OR

Q.3	**(a)**	Star wars Co. Ltd., uses simple exponential smoothing with smoothing constant $\alpha = 0.2$ to forecast the demand. The forecast for the first week of March was 400 units and the actual demand turns out to be 450 units.	**07**

       (i) Estimate the demand for the second week of March.
       (ii) If the actual demand for the second week of March is 460 units, forecast the demand up to April second week. Assume that the demand for the subsequent weeks is 465,434,420,498,462 and 470 units.

	(b)	Explain Forecast error namely MAD & BIAS.	**07**

OR

Q.4 **(a)** ABC company plans to sell an article at local market. The articles are **07** purchased at Rs. 5 on the condition that all unsold articles shall be returned. The rent for the space is Rs. 2000. The articles will be sold at Rs. 9. Determine the numbers of articles which must be sold (a) To break-even, (b) To earn Rs. 400 as profit; (c) If the company sells 750 articles. Calculate margin of safety and profit.

(b) Explain the following terms with respect to Break Even Analysis (i) BEP (ii) **07** Margin of Safety (iii) Angle of Incidence

OR

Q.4 **(a)** XYZ company produces toilet soaps at their works at Mumbai. Aggregate **10** planning measures used by XYZ are tones of soap which includes making and packaging of the soap. The planning is done for a time horizon of one year and for 4 quarters.

Quarter	I	II	III	IV
Demand (tones)	40	60	50	45

The company has a regular workforce which can produce 35 tonnes of output per quarter. If the workers are allowed overtime with a restriction that the extra time cannot be more than 20% of the regular time in any time. The output rate is 25% higher than regular time during overtime but the overtime expenses are 40% more than that of regular time. The company subcontracts the soap making & packaging operation to a SSI unit but only at the cost of 50% premium than the cost of regular production. The regular time production costs are Rs. 10,000 per ton.

No shortags are allowed as per company policy. Inventory carrying costs are Rs. 5000 per ton per annum.

Design the cost efficient aggregate plan assuming zero starting inventories. Compute total production cost.

(b) Explain any ONE aggregate planning strategy to meet Non-Uniform Demand. **04**

Q.5 **(a)** The processing times and due dates of jobs for a single machine scheduling is **07** given.

Job (j)	1	2	3	4	5	6	7
Processing time (tj)	10	8	8	7	12	15	18
Due Date (dj)	15	10	12	11	18	25	30

Determine the sequence which will minimize the maximum lateness and also determine the maximum lateness with respect to the optimal sequence.

(b) What are assumptions made to solve the sequencing problem? What is **07** the difference between loading, sequencing & scheduling?

OR

Q.5 **(a)** Explain following terms with respect to line balancing (i) Workstation (ii) **07** Cycle time (iii) Task (iv) Station time (v) Balance Delay (vi) LE (vii) SI

(b) Due to which factors Line Balancing Problems arises. Briefly explain **07** Heuristic Method of Line Balancing.

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