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B. Tech

HSSM 4302

Fifth Semester (Special) Examination – 2013

PRODUCTION AND OPERATION MANAGEMENT

BRANCH : AEIE,CIVIL,CSE,EC,ELECTRICAL,ETC,IT,MECH,TEXTILE

QUESTION CODE : D 254

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

   (a) Which type of production system and plant layout will be suitable for a manufacturing organization that produces large variety of production in small quantities ?

   (b) What are important characteristics of a good plant layout ?

   (c) List various factors that should be considered for facility location decision.

   (d) Write the assumptions made in deriving expression for economic order quantity in basic EOQ model.

   (e) Between P system and Q system, which one is more suitable for low value (C Class) items ? Give reason.

   (f) What is forecast error ? How is it expressed ?

   (g) Write the application of Operation Process Chart.

   (h) Define different levels of Aggregate planning

   (i) Write two important characteristics of a good production plan.

   (j) Explain the term Kaizen, and Poka Yoke.

2. (a) Describe the steps used in method study for making improvement in a process. 5

(b) Stop watch reading for completion time of different elements of work is given below : 5

Work element	Cycle (Time in minutes)				
	1	2	3	4	Rating
A	1.22	0.24	7.12	6.87	90%
B	3.45	–	9.66	–	80%
C	6.65	3.87	3.60	9,78	100%
D	8.54	5.80	5.53	1.56	120%

Considering the allowance of 25% determine Normal time and Standard time.

3. (a) Explain plant layout based on the concept of Group Technology. 5

(b) What is Assembly Line Balancing ? How is it done ? 5

4. The production volume for last seven months is as follows :

570, 590, 600, 620, 640, 670, 680

Forecast demand for the eight month by using 3 months Moving Average Method as well as by Exponential Smoothing Method for ALPHA = 0.3. Determine forecast error in both the cases. 10

5. (a) Compare Level Output Rate plan and Chase plan production strategy. 5

(b) An automobile company has extra capacity that can be used to produce gears that the company has been buying for Rs.300 each. if the company makes the gears, it will incur materials cost of Rs.90 per unit, labour cost of Rs.120 per unit and variable overhead cost of Rs.30 per unit. The annual fixed cost associated with the unused capacity is Rs.2,40,000. Demand over the next year is estimated at 4000 units. Would it be profitable for the company to make the gears ? 5

6. (a) What are various prioritization rules for sequencing of jobs ? Apply Criticality Ratio rules for sequencing of jobs given below and determine minimum average tardiness, mean flow-time and number of tardy jobs.

Job	1	2	3	4	5	6	7
Due date	22	30	9	6	25	35	14
Processing time	8	6	4	3	10	7	9

(b) Ten jobs to be processed through two machines M1 and M2. The processing time (in hours) required for each job is given below.

Job	M1	M2	Job	M1	M2
A	4	5	F	2	6
B	3	2	G	6	8
C	5	3	H	5	4
D	5	9	I	6	7
E	2	3	J	8	4

Apply Johnson Rule to sequence these jobs. 5

7. (a) Annual consumption of a particular item is 25000 units. The item is sold in packets of 500 units and the cost of one packet containing 500 items is Rs.20000. Cost of ordering is Rs4000 per order and rate of inventory carrying cost is 25%. How many packets of items should be ordered at a time ? 5

(b) What is batch production ? Derive the expression for Economic Batch Quantity (EBQ). 5

8. Write short notes on any **two** of the following : 5×2

(a) Work Sampling

(b) Shop Floor Control by Kanban

(c) ABC Analysis.