(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2544 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

PRODUCTION PLANNING AND CONTROL

Time : 3 Hours *Total Marks : 100*

Note :—(1) Attempt ***all*** questions.

(2) All questions carry equal marks.

(3) Make assumption/correction wherever necessary by giving proper justification.

1. Attempt any ***four*** parts:—

(a) Describe the relationship, in detail, between the phases of product life cycle and production system types for a product/a product line/variants of a product.

(b) Under what conditions are process-focused, to-stock system and a product-focused, to-order system justified ? Explain process-focused, to-stock system.

(c) What are the dimensions of competitiveness that measure the effectiveness of the operations functions ?

(d) Show that exponential forecasting system actually give weight to all past data. When should we use judgemental methods of forecasting ?

(e) What is market centroid ? Discuss the usefulness of cost-profit-volume analysis in locating a service operation.

(f) Consider the following tasks of an assembly and develop a three station assembly line. What is cycle time ?

Task	Time (sec.)	Predecessor
A	30	—
B	20	—
C	8	A
D	14	A
E	16	B
F	20	B, D
G	25	E
H	6	G
I	16	E
J	20	H
K	12	H
L	6	J

2. Attempt any ***four*** parts :—

(a) What is Master Production Schedule (MPS) ? How does it differ from a forecast ? What is lead time offsetting ?

(b) Write short notes on the following :—

(i) Pegged requirements;

(ii) CRP;

(iii) Planned orders; and

(iv) Open orders.

(c) A Regulator Company produces pressure regulator that are composed of two pan assembly; a diaphragm; and six bolts. A pan assembly consists of a pan and two half collars. One sheet of rubber provides enough material for three diaphragms. One sheet of 0.1-in-thick steel is required for each 10 pans. One sheet of 0.2-in-thick steel is required for each 50 half collars. Develop a product structure tree pressure-regulator. Company plans to make 300 pressure regulators in a scheduled production run. How many of each component must be obtained if no inventory is available and no open orders are outstanding ?

(d) Describe in your own words the steps involved in rough-cut capacity planning.

(e) MM Shop has four jobs waiting to be run on the milling machine and three of them must then go to the drill press for the next operation before they are completed. There is an operator for each machine. Time for two processes are shown below :—

Job	Milling (Hours)	Drilling (Hours)
A	3.20	2.10
B	2.50	1.25
C	1.70	3.00
D	2.10	0.00

(i) Sequence the jobs so that all will be completed in minimum time.

(ii) How long will the milling and drilling press machine be operated to do these jobs ?

(f) The SB Aircraft Company has just produced the first of its model R-80 airplanes, which requires 34,000 direct labour hours. The company has experienced a 90% learning curve for similar aircraft it has produced in past. How long will the 10^{th} and 20^{th} airplane take ?

3. Attempt any ***two*** parts :—

(a) Describe briefly three methods that may be used to establish the amount of safety stock a company carries.

(b) Durango Castings has a long-term contract to deliver 1,450 pump housing per week, 52 week of the year. The company has a high-capacity machine that can produce these castings at a rate of 4,500 units per week. It costs $ 250 to set up this machine, and each unit produced by this method cost $ 21.50. The holding cost is 24% per year. Determine EPL, total annual set-up and holding costs if the company operates with this EPL.

(c) ABC sportswear can purchase a special shipment of wool caps for $ 3.29 each. The caps can be sold for $ 6.95 during fall season, but any that have not been sold by Christmas will be reduced to $ 2.50. The following probability distribution has been estimated for demand for these caps prior to Christmas Caps

must be purchased in dozens. Assume that any caps unsold by Christmas can be sold at the lower price.

Demand (D) (Dozens)	Probability that demand will equal this number [P(D)]
4	0.05
5	0.15
6	0.25
7	0.25
8	0.15
9	0.10
10	0.05

4. Attempt any *two* parts :—

(a) What do you mean by term "value" used in Value Engineering and its importance ? Discuss Value Engineering in detail. Also discuss values analysis job plan.

(b) Explain Renard preferred numbers used in standardization. Use a small example for your discussion. Is it worth-while to use geometric series always ? Give the reasons for your reply.

(c) What are the advantages of production standardization ? Link the process of standardization of newly launched product with its life cycle phases.

5. Attempt any ***four*** parts :—

(a) Discuss the model of concurrent engineering. What do you mean by automating concurrent engineering process ?

(b) Under what conditions MRP is used ? Enlist and discuss its inputs and outputs.

(c) SAP is said to be an ERP software. Expand SAP. Discuss the framework of ERP under SAP.

(d) (i) What is a Work Break Down Structure (WBS) ?

(ii) Why is a WBS useful ?

(e) Discuss the importance of a near-critical path of project under probabilistic conditions. Expand followings :—

(i) PERT;

(ii) GERT; and

(iii) CPM.

(f) Given below are the durations and precedence relationships for the activities of a project. Find critical path, project duration and float for each activities.

Activity	Duration (Days)	Must precede
A	6	B, F, C
B	12	L
C	12	E
D	8	K
E	12	K

Activity	Duration (Days)	Must precede
F	16	L, G
G	5	H, E
H	6	K
K	7	—
L	11	D