Q 6509

M.B.A. DEGREE EXAMINATION, MAY/JUNE 2006.

Second Semester

BA 1651 — PRODUCTION MANAGEMENT

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the components of 'CIM'.

2. Differentiate between Production management and Operations management.

3. List the components of 'MRP'.

4. Why do we require safety stock?

5. List atleast any two tools to evaluate a forecasting model.

6. List the operational research methods applicable in the aggregate planning problems.

7. How do you prepare a Gantt chart?

8. Difference between PERT and CRM techniques.

9. Write the learning curve equation.

10. List the inputs required for using CRAFT technique.

PART B — (5 × 16 = 80 marks)

11. (i) Discuss the steps involved in conducting 'ABC' analysis and classify the following items into 'A', 'B' and 'C'. The company records provide the following information

Item	Annual Usage in numbers	Cost (Rs. per unit)
G1	40,000	.07
G2	1,95,000	.11
G3	4,000	.10
M1	1,00,000	.05

Item	Annual Usage in numbers	Cost (Rs. per unit)
M2	2,000	.14
M3	2,40,000	.07
M4	16,000	.08
P1	80,000	.06
P2	10,000	.07
P3	5,000	.09

(ii) Discuss the components of ordering cost and shortage cost.

12. (a) Discuss the various strategies to be adopted in aggregate planning when the demand pattern follows a seasonal pattern?

Or

(b) From the data given below, forecast-monthly demand if $\alpha = 0.2$ and $\beta = 0.3$. Assume that actual demand in the first month is the same as the forecasted demand and the initial level and the trend for month 1 are 10. From these results, forecast the demand for period 8.

Month	1	2	3	4	5	6
Demand	20	30	35	30	50	55

Find the tracking signal for the above data?

13. (a) Discuss the difficulty of scheduling a job shop.

(b) A computer manufacturer has sold hardware system to five different customers. Five of the manufacturer's maintenance engineers service the systems periodically. The time each engineer takes on the five installations varies, as shown in the following matrix.

Maintenance Engineer	Computer installation time (Hours)				
	1	2	3	4	5
A	8	3	15	2	7
B	10	6	18	2	11
C	4	17	4	2	13
D	11	16	14	2	12
E	9	12	10	2	6

(i) How should the engineers be assigned to minimize the total maintenance time?

(ii) What is the minimum maintenance time?

Or

(c) Discuss the contribution of following in the development of operations management.

(i) Adam smith.

(ii) F.W. Taylor.

(iii) F.J. Roethlisberger.

14. (a) Consider the following project (times given in days)

Activity	a	m	b	Predecessors
A	1	4	7	–
B	2	2	2	–
C	2	5	8	A
D	3	4	5	A
E	4	6	8	C, B
F	0	0	6	C, B
G	3	6	9	D, E

(i) Draw the network.

(ii) Compute all expected activity time, variances and slacks.

(iii) Find the probability that the project will be done in 23 days.

(iv) Find expected completion time corresponding to 95% probability.

Or

(b) Explain the Johnson's Rule. Find the makespan for the following problem.

Job j	1	2	3	4	5
t_{j1}	3	5	1	6	7
t_{j2}	6	2	2	6	5

15. (a) After completing a methods study of a work station where an operator places a time mechanism on a home-appliance frame, the following data in minutes were recorded from a stop watch time study :

Observed Cycle	Work Element					
	1	2	3	4	5	6
1	.25	.20	.41	.19	.30	.52
2	.23	.20	.40	.18	.30	.52
3	.24	.20	.42	.20	.30	.51
4	.24	.20	.41	.19	.30	.54

Observed Cycle	Work Element					
	1	2	3	4	5	6
5	.26	.20	.43	.19	.30	.52
6	.23	.20	.43	.21	.30	.53
7	.24	.20	.41	.20	.30	.52
8	.24	.20	.42	.21	.30	.54
9	.25	.20	.42	.22	.30	.51
10	.27	.20	.44	.21	.30	.53

The operator for this job was rated at 115% for elements 1, 3, 4 and 6. Elements 2 and 5 were machine controlled. The allowance for this type of work is 12%.

(i) Determine the normal time for this operation.

(ii) Calculate the standard time for this operation.

(iii) What is the daily standard output rate for this operation if the plant operates two 8-h shifts?

Or

(b) The Safe Appliance Co. also operates an assembly line for electric toasters set up for 10 tasks A to L. They must be performed in alphabetical order, and they are grouped in five work stations, shown below, manned by one worker each.

Work Station	Assembly tasks	Task times, min.
1	A	3.5
2	B, C	1.2, 2.1
3	D, E, F	0.9, 1.8, 1.3
4	G, H, I	1.7, 1.4, 0.6
5	J, K, L	1.1, 2.0, 0.7

(i) Which work station is the bottleneck in the assembly line?

(ii) What is the minimum cycle time, i.e. the shortest possible time to complete one toaster?

(iii) What is the daily output rate of this assembly line if the plant operates one 8-h shift daily?

(iv) What is the percentage utilization of the operator at each work station?

(v) If the efficiency of a production line is equal to the ratio of productive versus available time per day, calculate the efficiency of the assembly line for toasters.
