P9_Practice Test Paper_Syl12_Dec13_Set 2

Paper 9 : Operations Management and Information Systems

Full Marks-100 **Time Allowed 3 Hours**

Section - A

Question No. 1 is compulsory and any 4 from the rest

1. Answer any six.

(a) The demand function of a monopolist is $P=\frac{3}{q}$ and the cost function of is $C = 2q + 3q^2$.

Will the monopolist produce the commodity if his objective is to maximize profit?

(b) Describe about capital spare parts.

(c) Limitations of Preventive Maintenance.

(d) A firm operates 6 days a week on single shift of 8 hours per day basis. There are 10 machines of the same capacity in the firm. If the machines are utilized for 75 percent of the time at a system efficiency of 80 percent, what is the rated output in terms of standard hours per week?

(e) What are the success factors of QFD.

(f) Mention the characteristics of Just –in- Time systems.

(g) An analyst wants to obtain a cycle time estimate that is within ± 5% of the true value. A preliminary run of 20 cycles took 40 minutes to complete and had a calculated standard deviation of 0.3 minutes. What is the coefficient of variation to be used for computing the sample size for the forthcoming time study?

(h) Standard time for a task is 8 hours. Calculate the efficiency of a workman in the following cases:

(i) Worker completes the job in 10 hours.

(ii) Worker completes the job in 6 hours. **[6x2=12]**

2. (a) The automobile company manufactures around 150 scooters. The daily production varies from 146 to 154 depending upon the availability of raw material and other working conditions:

Production Per Day	Probability
146	0.04
147	0.09
148	0.12
149	0.14
150	0.11
151	0.10
152	0.20
153	0.12
154	0.08

The finished scooters are transported in a specially arranged lorry accommodating 150 scooters. Using following random numbers:
80, 81, 76, 75, 64, 43, 18, 26,10,12,65,68,69,61,57. **Simulate the process to find out:**

(i) What will be the average number of scooters waiting in the factory?

(ii) What will be the average number of empty space on the lorry?

(b) Describe the Importance of Product Design. **[10+2]**

3(a) The manager of an oil refinery must decide on the optimum mix of two possible blending processes of which the inputs and outputs per production run is as follows:

Process	Input		Output	
	Grade A	Grade B	Gasoline X	Gasoline Y
1	6	4	6	9
2	5	6	5	5

The maximum amounts available of crudes A and B are 250 units and 200 units respectively. Market demand shows that at least 150 units of gasoline X and 130 units of gasoline Y must be produced. The profits per production run from process 1 and Process 2 are ₹400 and ₹ 500 respectively. Formulate the problem for maximizing the profit.

(b) A radio manufacturer makes x sets of radio per week and total cost is $\left(\frac{x^2}{25}+3x+100\right)$.

The equation of the demand function is x = 75 - 3p (p = price). Show that if he wants to maximize profit, he will produce about 30 sets of radio per week. What price per set will he charge?

(c) Describe the Baumol's Model of "sales maximization subject to a profit constraint" and "maximization of short –run profits subject to a minimum sales or market share constraint". **[4+4+4]**

4(a) A departmental store has a single cahier. During the rush hours, customer arrives at a rate of 20 customers per hour. The average number of customers that can be processed by the cashier is 24 per hour. Assume that the conditions for use of the single – channel queuing model apply.

Required:

(i) What is the probability that the cashier is idle?
(ii) What is the average number of customers in the queuing systems?
(iii) What is the average time a customer spends in the system?
(iv) What is the average number of customers in the queue?
(v) What is the average time a customer spends in the queue waiting for service?

(b) Discuss the objectives of the Material Requirement Planning. **[(2x5)+2]**

5 (a) Five machines are available to do five different jobs. From past records, the time (in hrs.) that each machine takes to do each job is known and given in the following table:

Machines	Job				
	I	II	III	IV	V
A	2	9	2	7	1
B	6	8	7	6	1
C	4	6	5	3	1
D	4	2	7	3	1
E	5	3	9	5	1

Find the assignment of machines to jobs that will minimize the total time taken.

(b) Describe about the Line Balancing. **[10+2]**

6(a) The number of breakdowns of equipment over the past 2 years below:

No. of Break downs	No. of month this occurred
0	3
1	7
2	9
3	3
4	2
Total	24

Each break down costs an average of ₹ 300. Preventive maintenance service can be hired at a cost of ₹ 150 per month and it will limit the breakdowns to an average of one per month. Which maintenance arrangement is preferable, the current break down maintenance policy or a preventive maintenance service contract?

(b) Describe the objectives of Human Resource Planning. **[10+2]**

Section – B

Question no. 7 is compulsory and any four questions from the

7. (a) List the function of a Query Compiler.
(b) Define Black Box Testing in relation to System Testing.
(c) Describe the term Commerce Net in brief.
(d) State the use of Electronic Data Interchange. **[2×4]**

8. (a) Enumerate the disadvantages of Database Management System. **[6]**
(b) Discuss the risks associated with System development Life Cycle. **[2]**

9. Explain the term Information System Infrastructure. **[8]**

10. (a) State the meaning of Program Debugging and list the steps involved in Debugging. **[2+4]**
(b) Define Computer Network. **[2]**

11. Level of Management activity has a clear impact on the information requirements of executives, Discuss. **[8]**

12. How the Corporate Strategy be linked with Information System Strategy? **[8]**