P9_Practice Test Paper_Syl12_Dec13_Set 3

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. (a) If the demand function is $X = \frac{20}{p+1}$, determine the price elasticity of demand if p=3.

(b) A job has been time standard for 20 observations. The mean actual time was 5.83 minutes and the standard deviation of the time is estimated to be 2.04 minutes. How many total observations should be taken for 95% confidence that the mean actual time has been determined within 10%?

(c) The demand for sewing machine was estimated as 1000 per month for 5 months. Later on the actual demand was found as 900, 1050, 1000 and 950, respectively. Calculate the Tracking Signal.

(d) An assembly line of an item A has the following output in a 10 week period:

Week No	1	2	3	4	5	6	7	8	9	10
Std. hrs produced	350	375	380	400	300	325	340	370	390	350

Calculate the demonstrated capacity of the assembly line per week.

(e) List the name of the Qualitative Approaches.

(f) Discuss the Input/ Output Control. **[6x2 =12]**

2. (a)Discuss the objectives of Maintenance Management.

(b)The Simple Engineering Company has a machine whose purchase price is ₹80,000. The expected maintenance costs and resale price in different years are as given here:

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Maintenance Cost (₹)	1,000	1,200	1,600	2,400	3,000	3,900	5,000
Resale Value ('000 ₹)	75	72	70	65	58	50	45

After what time interval in your opinion, should the machine be replaced?

(c) State the Cycle Time in the Line Balancing. **[5+5+2]**

3. (a) Request for maintenance service made upon a centralized maintenance facility have been simulated for a typical 8 hour shift with arrival and service pattern as shown below:

Request arrival (Clock) time	**Repair service Time**

1:30	60 mins
2:00	20 mins
4:15	45 mins
4:30	120 mins
5:30	30 mins
7:30	10 mins

The labour charges of maintenance crew is ₹ 40 per hour whether working or idle. The waiting time or operators and machinery that has broken – down is costed at ₹ 70 per hour.

(i) Find the idle cost of the maintenance facility.
(ii) Find the waiting time cost of operators and machinery (not including repair time).
(iii) Find the total facility idle time and machinery waiting time cost.
(iv) Assuming that for an additional cost of ₹ 10 per hour the maintenance centre could add another crew and decrease the repair time by one third, would the additional cost be justified?

(b) A fleet owner finds from his past records that the costs per year of running a vehicle whose purchase price is ₹ 50,000 are as under:

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Running Cost (₹)	5,000	6,000	7,000	9,000	11,500	16,000	18,000
Resale Value (₹)	30,000	15,000	7,500	3,750	2,000	2,000	2,000

Thereafter, running cost increases by ₹ 2,000, but resale value remains constant at ₹ 2,000. At what age is a replacement due? **[8+4]**

4. (a)A firm owns facilities at six places. It has manufacturing plants at places A, B and C with daily production of 50, 40, and 60 units respectively. At point D, E, and F it has three warehouses with daily demands of 20, 95, and 35 units respectively. Per unit shipping costs are given in the following table. If the firm wants to minimize its total transportation cost, how should it route its products by using its LCM?

		Warehouse		
		D	**E**	**F**
Plant	**A**	6	4	1
	B	3	8	7
	C	4	4	2

(b) Given is the following information regarding a project:

Activity	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Dependence	-	-	-	AB	B	B	FC	B	EH	EH	CDFJ	K
Duration	3	4	2	5	1	3	6	4	4	2	1	5

Draw the Network Diagram and identify the Critical Path and Project Duration. **[6+6]**

5. (a) A farmer has a farm with 125 acres. He produces Carrot, Beetroot and Potato. Whatever he produces is fully sold in the market. He gets ₹ 5 per kg for carrot, ₹ 4 per kg for Beetroot and ₹ 5 per kg for potato. The average yield is 1500 kg for Carrot per

acre, 1800 kg of Beetroot per acre and 1200 kg of Potato per acre. To produce each 100 kg of Carrot and Beetroot and 80 kg of Potato, a sum of ₹ 12.50 has to be spent for manure. Labour required for each acre to raise the crop is 6 man – days for carrot and Potato each and 5 man- days for Beetroot. A total of 500 man days of labour at the rate of ₹40 per man – day are available. Formulate a LPP to maximize the farmer's total profit.

(b) Discuss the advantages of Network Scheduling. **[9+3]**

6. (a) Describe the objectives of Time Study.
(b) Following is the data obtained from the Bureau of Industrial Costs and Prices. Have the prices kept pace with the rising costs?

Note 2004 =100

	2004	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**
Costs per unit of Output	203	216	223	239	248	253	279	301	311
Price per final output	225	242	250	271	275	277	295	318	329

[6+6]

Section – B

Question No. 7 is compulsory and any 4 from the rest

7. (a) Define - Digital Signature.
(b) What is meta – data?
(c) Mention the names of Software Packages which serve as an aid in programme analysis.
(d) What is Coding of Information? **[4 x2 =8]**

8. (a) Discuss what is On – Line Transaction Processing (OLTP).
(b) What is the role of Database Designer?
(c) Define "key pair" in the context of Asymmetric Crypto System. **[3+3+2]**

9. (a) Write a note on Public Key Infrastructure (PKI) processes.
(b) Define - Management Information System. **[6+2]**

10. (a) List the benefits of Electronic Data Interchange.
(b) Write a note on Data Dictionary. **[4+4]**

11. (a) Describe the types of system.
(b) List the role of Information Systems in Management. **[6+2]**

12. (a) Discuss the major factors to be considered in designing user input and user output in relation to a system.
(b) What is programming language? **[6+2]**