Paper 9 - Operations Management and Information Systems

Section –A

[Question no. 1 is Compulsory and any 4 from the rest]

1. Answer the following questions: [6x2]
   (a) A workshop has 20 nos. of identical machines. From the failure pattern of the machines it is calculated that the expected time before failure is 3 months. It costs ₹200 to attend a failed machine and rectify the same. Compute the yearly cost of servicing the broken down machines.
   (b) Name the core concepts of Total Quality Management?
   (c) A shaft of 6000 mm in length requires machining on a lathe. If the spindle executes 3000 r.p.m. and the feed is 0.20 mm per revolution, how long does it take the cutter to pass down the entire length of the shaft?
   (d) Discuss the advantages of Vertical Integration.
   (e) What are the factors affecting the process planning?
   (f) What is Risk Purchase?

2. (a) The faculty in an engineering institute is planned to rise to strength of 50 staff members and then to remain at that level. The wastage of recruits depends upon their length of service and is as follows:

Year	1	2	3	4	5	6	7	8	9	10
Total %age who left upto the end of year	5	35	56	65	70	76	80	86	95	100

   (i) Find the number of staff members to be recruited every year.
   (ii) If there are seven posts of Head of Department for which, length of service is the only criterion of promotion, what will be the average length of service after which a new entrant should expect promotion? [6+4]
   (b) What type of works are carried out during routine maintenance? [2]

3. (a) A public transport system is experiencing the following number of breakdowns for months over the past 2 years in their new fleet of vehicles:

Number of breakdowns	0	1	2	3	4
Number of months this occurred	2	6	8	5	1

   Each breakdown costs the firm an average of ₹2800. For a cost of ₹1500 per month, preventive maintenance can be carried out to limit the breakdowns to an average of one per month. Which policy is suitable for the firm? [5]
   (b) Write a note on Problem Formulation under Linear Programming. [3]
   (c) Define 5 S's concept in Quality Management. List the five primary 5S phases [4]

4. (a) A manager has to decide about the number of machines to be purchased. He has three options i.e. purchasing one, or two, or three machines. The data are given below:

Number of machines	Annual Fixed cost (₹)	Corresponding range of output (units)
1	10,000	0 to 400
2	12,000	401 to 700
3	20,000	701 to 1000

Variable cost is ₹ 20 and revenue is ₹ 40 per unit.

    (i) Determine the break-even point for each range.

    (ii) If projected demand is between 600 and 750 units, how many machines should the manager purchase? **[3+4]**

(b) Write a short note on Computer Aided Design. **[5]**

5. (a) Draw the network for the following activities and find critical path and total duration of project:

Activity	Duration (months)	Activity	Duration (months)
1-2	2	4-7	3
1-3	2	5-8	1
1-4	1	6-8	4
2-5	4	7-9	5
3-6	5	8-9	3
3-7	8		

[8]

(b) What are the steps involved in Work Sampling? **[4]**

6. (a) What are the various factors to be considered for deciding on automation alternatives? **[6]**

(b) State the benefits for the individual by adopting quality circles. **[6]**

Section – B

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

7. (a) Define Data Mart.

(b) What is Gap Analysis?

(c) What do you mean by Modularity?

(d) What do you mean by final acceptance testing? **[4 x2]**

8. (a) ABC Ltd. is considering two options to acquire software for computerizing one of its important functional areas. The options are:

    (i) Buying the software package available in the market

    (ii) Engaging software industries to design the software **[3+3]**

(b) Name the different stages of the System Development Life Cycle. **[2]**

9. (a) Briefly explain the different models of DBMS? **[6]**

(b) Define Normalization. **[2]**

10. Write short notes on **[2x4]**

(a) Knowledge Management

(b) Decision Hierarchy

11. (a) What are the salient features of LAN? **[4]**

(b) What is an ERP package? What are the reasons for accepting ERP system as an ideal system for replacing the old business system? **[1+3]**

12. (a) What is electronic cash? What are the steps involved in transferring money between parties? **[1+4]**

(b) Write short note on Search Engines **[3]**