Paper 9 - Operations Management & Information System

Full Marks: 100 **Time allowed-3hrs**

This paper contains 3 questions. All questions are compulsory, subject to instruction provided against each question. All workings must form part of your answer. Assumptions, if any, must be clearly indicted.

Question No. 1 : Answer all questions. [20 marks]

1. (a) 'Design for Manufacturing and Design for Assembly are related concepts in manufacturing'. Justify. 2
   (b) Define Time Study. 2
   (c) For a certain element of work, the basic time is established to be 20 seconds. A time study observer record rating of 125 on a 100 normal scale. What is the observed time? 2
   (d) Define Customer-Driven Quality. 2
   (e) What is Rotable Spare? 2
   (f) Define Material Planning. 2
   (g) What is Commerce Net? 2
   (h) Define programmed decision making. 2
   (i) Define Feasibility Study. 2
   (j) What is legacy data? 2

Operation Management

Answer any three questions

2. (a) (i) Explain the term Quality Function Deployment (QFD). 5
   (ii) List the important steps in problem analysis. 3
   (iii) State the causes of low productivity. 3
   (iv) 'Bain suggests that a good productivity measure should possess the following properties.' List the properties. 5

   (b) (i) Identify the five common process decisions considered by production/operations managers. 5
   (ii) Production Manager of a unit wants to know from what quantity he can use automatic machine against semi-automatic machine.

Data	Automatic	Semi-automatic
Time for the job	4 mins	10 mins
Set up time	4 hrs	3 hrs
Cost per hour	₹40	₹24

   Calculate the break-even point. 7

   (iii) The demand for three months for 100 Watt bulbs is given below:

Period	January	February	March
Demand	1000	1200	1600

   If the weight assigned to the period of January, February and March are 0.25, 0.35 and 0.4 respectively, forecast the demand for the month of April by using Weighted Moving Average Method. 4

(c) (i) The breakdown probability of an equipment is given below:

Month	Probability
1	0.05
2	0.15
3	0.30
4	0.30
5	0.20

There are 50 such equipments in the plant. The cost of individual preventive replacement is ₹15 per equipment and the cost of individual breakdown replacement is ₹30 per equipment. Which is the most suitable maintenance policy? Periodicities of replacement are considered every one, two, three and four months. 9

(ii) State the activities included in JIT manufacturing. 7

(d) (i) A retailer deals in a perishable commodity. The daily demand and supply are variables. The data for the past 500 days show the following demand and supply:

Availability (Kg.)	Supply (No. of days)	Demand (Kg.)	Demand (No. of days)
10	40	10	50
20	50	20	110
30	190	30	200
40	150	40	100
50	70	50	40

The retailer buys the commodity at ₹ 20 per kg. and sells at ₹ 30 per kg. Any commodity remains at the end of the day, has no sales value. Moreover the loss on unsatisfied demand is ₹ 8 per Kg. Given the following pair of random numbers, simulate 6 days sales, demand and profit: (31, 18) (63, 84) (15, 79) (07, 32) (43, 75) (81, 27). The first random number in the pair is that of supply and the second random number is for demand.

(ii) A project with normal duration and cost along with crash duration and cost for each activity is given below:

Activity	Normal time (Hrs.)	Norman cost (₹)	Crash time (Hrs.)	Crash cost (₹)
1-2	5	200	4	300
2-3	5	30	5	30
2-4	9	320	7	480
2-5	12	620	10	710
3-5	6	150	5	200
4-5	0	0	0	0
5-6	8	220	6	310
6-7	6	300	5	370

Overhead cost is ₹ 50 per hour.

Required:

(1) Draw network diagram and identify the critical path. [8+8]

Information System

Answer any two questions.

3. (a) (i) Discuss the purpose for providing persistent storage for program objects and data structures. 5

(ii) Describe the four types of implementation strategies. 6

(iii) What are the strengths/Advantages of Prototyping Model. 5

(b) (i) State the requirements of E-Procurement. 3

(ii) List the major characteristics of Transaction Processing Systems. 5

(iii) Describe Transaction Processing System. 4

(iv) List the major constraints in operating MIS. 4

(c) (i) Discuss whether web server can act as Permanent Establishment. 4

(ii) List the steps involved to develop a sound public key infrastructure for an efficient allocation and verification of digital signatures certificates. 4

(iii) 'The digital signature is created in two distinct steps.' Justify. 3

(iv) State the notable features of the Information Technology Amendment Act, 2008. 5