Paper 9 - Operations Management & Information Systems

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

Section I: Operation Management

Answer Question No. 1 which is compulsory and any Two questions from the rest, under Section I.

Working Notes should form part of the answer.

1.

a) Choosing The Correct Answer: [4]

i) The act of assessing the future and make provisions for it is known as
- A. Planning
- B. Forecasting
- C. Assessment
- D. Scheduling

ii) For a marketing manager, the sales forecast is:
- A. Estimate of the amount of unit sales for a specified future periods
- B. Arranging the salesmen to different segment of the market
- C. To distribute the goods through transport to satisfy the market demand
- D. To plan the sales methods.

iii) One of the product examples for line layout is
- A. Repair workshop
- B. Welding shop
- C. Engineering colleges
- D. Cement

iv) One of the advantages of Method of Least square is
- A. It is a very easy method
- B. It does not use mathematics
- C. Trend values of all years of the series may be obtained
- D. None of the above

b) Give your views on the following statements [4]
- i) Incentives are substitute for lower wages
- ii) Mechanization and Automation lower employee morale
- iii) Total productivity of a given situation cannot be measured in absolute terms
- iv) Method study should precede work measurement.

c) Expand the items in List 'A' and match them with the related functional areas of production management in List 'B' : [6]

List 'A'	List 'B'
VA	Cost Benefit Analysis
IFCI	Cost Control
CBA	Project funding
USP	Statistical quality control
ILO	Marketing strategy

LCL	Labour related standards

2.

a) A large computer installation contains 2,000 components of identical nature which are subject to failure as per probability distribution that follows:

Month End:	1	2	3	4	5
% Failure to date:	10	25	50	80	100

Components which fail have to be replaced for efficient functioning of the system. If they are replaced as and when failures occur, the cost of replacement per unit is ₹ 3. Alternatively, if all components are replaced in one lot at periodical intervals and individually replace only such failures as occur between group replacement, the cost of component replaced is ₹ 1.

(i) Assess which policy of replacement would be economical.

(ii) If group replacement is economical at current costs, then assess at what cost of individual replacement would group replacement be uneconomical.

(iii) How high can the cost per unit in group replacement be to make a performance for individual replacement policy? [6+3+3=12]

b) A company has two plants P and Q with fixed costs of ₹1,00,000 and ₹1,50,000 respectively. Both the plants are designed to produce up to 10,000 units each. The variable costs of two plants due to difference of production are as follows:

Production (Units)	Plant P (₹)	Plant Q (₹)
2,500	72,000	58,000
5,000	90,000	78,000
7,500	1,54,000	1,02,000
10,000	2,20,000	2,30,000

Find the most economic loading schedule. [6]

3.

a) A company, engaged in the manufacture of three products viz. A,B and C the available data are given in the tables:

Minimum Sale Requirements

Product	Minimum Sale Requirements per unit
A	10
B	20
C	30

Operations, Required Processing Time and Capacity

Operations	Time (hrs.) required per item of			Total available hours (per month)
	A	B	C	
1	1	2	2	200
2	2	1	1	220
3	3	1	2	180

Profit per unit

Product	Profit per unit (₹)
A	10
B	15
C	8

Formulate the linear programming problem only. [1+(½×6) =4]

b) State the differences in Programme Evaluation and Review Technique (PERT) and Critical Path Method (CPM). [6]

c) State the circumstances under which a company would go for either a time based policy or condition based policy for Preventive maintenance. [3]

d) List the points to be considered while designing a Maintenance programme for an organization. [5]

4.

a) The processing times for five jobs and their due dates are given for a single machine scheduling below.

Job (j)	1	2	3	4	5
Processing time (t_j) hrs	9	7	5	11	6
Due date (in days) (d_j)	16	20	25	15	40

A. Determine the sequence
B. Total completion time
C. Average completion time
D. Average number of jobs in the system and average job lateness using the following priority sequencing rules
   (i) Shortest Processing Time (SPT)
   (ii) Earliest Due Date (EDD)
   (iii) Longest Processing Time (LPT)
E. Compare the above characteristics for the three sequencing rules. [(3×5)+1]

b) The main shaft of calcinator has a very high reliability of 0.990. The equipment comes from Russia and has a high downtime cost associated with the failure of this shaft. This is estimated at ₹ 3 crore as the costs of sales lost and other relevant costs. However, this spare is quoted at ₹ 12 lakh at present. Should the shaft spare be procured along with the equipment and kept or not? [2]

Section II: Information Systems

Answer Question No. 5 which is compulsory and any two questions from the rest, under Section II.

5.

a) Put an appropriate word or phrase in blank position. [5]
i) ---------- is the abbreviation of the term binary digit.

ii) An extra bit in a byte that enables the computer to check for internal errors is called -------- bit.
iii) Laser printer is a ---------- printer.
iv) The range of frequencies available for data transmission is called-------.
v) The activities of an Information System is collection, generation and --------of information to right users.

b) State whether following statements are true or false: [5]
i) RAM is volatile, i.e contents are lost when power is switched off.
ii) Virtual memory is provision of secondary storage which acts as secondary memory.
iii) Multiplexer facilitates use of multiple lines to connect multiple computers.
iv) Viewing a taped television show is an example of synchronous communication.
v) BASIC is suitable for both scientific and commercial applications.

c) Write short notes on(any two): [2×2=4]
i) DHTML
ii) JAVA
iii) Extranet
iv) World Wide Web

6.

a) Explain Relational Data Base Management System. [3]
b) Describe system. Explain the types of system according to Interactive Behavior. [2+3]
c) "The final step of the system implementation is its evaluation." State the functions as being served by the system evaluation. Discuss different aspects of evaluation. [5]
d) Describe Data Dictionary. [3]
e) Explain Transform Analysis and Transaction Analysis. [2]

7.

a) List the liability under Law of Tort and Internet. [4]
b) State the concept of the cost of quality. [2]
c) Describe Electronic Data Interchange (EDI). State the use of Electronic Data Interchange (EDI). [4+2=6]
d) List any two reasons for the Spread of E- commerce. [2]
e) Explain ERP Accounts Payable and Receivable. [4]

8.

a) Describe configuration. State the general Mode of Configuration. [2+2=4]
b) Describe Information Technology. State its major components? [4]
c) List the basic functions of a computer. [4]
d) List the basic differences between Dumb Terminal and Intelligent Terminal. [2]
e) List out the differences between debugging and testing. [4]