Paper 9 - Operations Management & Information Systems

Time allowed-3hrs   Full Marks: 100

Section I
(Operations Management)
Answer Question No. 1 which is compulsory and answer any two from the rest, under Section I.

Working Notes should form part of the answer.

1. (a) Fill in the blanks given below: [1 x 4 =4]

    (i) ------------- is the interval between placing an order for a particular item and its actual receipt.

    (ii) ------------- Conveyors are used for loading cement into bags in a Cement Plant.

    (iii) Product is a combination of potential utilities for a ---------------.

    (iv) Statistical analysis is used to determine the optimum policy of ---------- maintenance.

  (b) Expand the following abbreviations: [1 x 5 =5]

    (i) CRM
    (ii) PDCA
    (iii) COPQ
    (iv) EMQ
    (v) LTPD

  (c) State whether following statements are true or false: [1 x 5 =5]

    (i) Technological obsolescence is major danger which business firms face in modern era.

    (ii) Quality of lot submitted for inspection is the percentage of defectives actually present in it.

    (iii) The concept of quality circle is primarily based upon recognition of the value of the worker.

    (iv) Quality of lot submitted for inspection is the percentage of defectives actually present in it.

    (v) Factor Comparison is a method of Job Evaluation.

2. (i) A Hospital has to pay nurses for 40 hours a week. One nurse is assigned to one patient. The cost per hour for each of the nurses is given below:

Patient → Nurse ↓	W	X	Y	
K	10	10	30	(i) Find the nurse patient combination to minimize cost to the hospital.
L	30	10	20	(ii) How much does each nurse earn per week?
M	20	30	20	

Suppose that a new patient Z is admitted and that a new nurse is appointed. The new patient is charged ₹40 per hour by each of the existing nurses. The new nurse charges ₹50 per hour irrespective of the patient.

(iii) What would be your revised calculations?

(iv) Comment on the new solution. **[12]**

(ii) The annual sale of ceiling fans by a dealer in Punjab are as under:

Year	2011	2012	2013	2014	2015
Sales (thousand units)	3	14	36	4	33

Fit a linear trend equation to the sales figure and estimate the sales for the year 2016. **[6]**

3. **(i)** State the advantages of KAIZEN Technique. **[5]**

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

Activity	Duration (days)	Activity	Duration (days)
1-2	34	2-5	37
1-3	27	2-6	18
1-4	41	3-5	10
2-3	38	3-6	16
2-4	85	4-5	19

[10]

(iii) Differentiate between Jigs and Fixtures. **[3]**

4. **(i)** A car manufacturing company manufactures 80 cars per day. The sale of cars depends upon the demand which has the following distribution.

Sale of cars	77	78	79	80	81	82
Probability	0.10	0.15	0.20	0.35	0.15	0.05

The production cost and sale price of each car are ₹4 lakhs and ₹5 lakhs respectively. Any unsold car is to be disposed of at a loss of ₹2 lakhs. There is penalty of ₹1 lakh per car, if the demand is not met. Using the following random numbers, estimate the total profit/loss for the next 10 days:

09	98	64	98	94	01	78	10	15	19

If the company decides to produce 79 cars per day, what will be its impact on profitability? **[12]**

(ii) A company has two grades of inspectors, 1 and 2 to undertake quality control inspection. At least 3,500 pieces must be inspected in an 8 hour day. Grade 1 inspector can check 50 pieces in an hour with an accuracy of 95%. Grade 2 inspector checks 25 pieces an hour with an accuracy of 90%.

The daily wages of grade 1 inspectors are ₹6 per hours while those of grade 2 inspectors are ₹5 per hour. Any error made by an inspector cost ₹4 to the company. If there are, in all, 20 grade 1 inspectors and 25 grade 2 inspectors in the company, find the optimal assignment of inspectors that minimizes the daily6 inspection cost. Formulate the LPP. **[6]**

Section II
Information System

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

5. **(a) Fill in the blanks given below :** [1 x 5 =5]
   (i) Decryption is the reverse process to convert the --------- form of text into readable text.
   (ii) The basic aim of ---------- in data structure is to eliminate redundancy and inconsistent dependency.
   (iii) Check digit is to ensure --------- of code.
   (iv) A record is identified by its -----------.
   (v) -------- is a process of assessing risk and reducing it to an acceptable level.

   (b) Expand the following abbreviations: [1 x 5 =5]
   (i) BASIC
   (ii) HLL
   (i) ISAM
   (ii) ORDBMS
   (iii) SET

   (c) State whether following statements are true or false: [1 x 4 =4]
   (i) Hybrid test is also known as sandwich testing.
   (ii) Transaction files are basically intermediate files created during processing for application area.
   (iii) ERP bridges the information gap across the organization.
   (iv) Data mart has no relevance to Data Warehousing.

6. (i) Explain the different testing methods employed in a software development. [8]
   (ii) "Debugging consists of four steps" – List the steps. [3]
   (iii) State the functions of query compiler. [2]
   (iv) State the two principal methods of using computers as audit tools. [5]

7. (i) 'The methodology of implementation of ERP system can be divided into five phases"-Discuss. [7]
   (ii) From the following two relations find the Intersection operator and Difference operator.

Relation A

REGN_NO	NAME	OCCUPATION
AB 03	J	SERVICE
AB 04	K	STUDENT
AB 05	S	STUDENT
AB 09	D	SERVICE
AB 11	P	STUDENT

Relation B

REGN_NO	NAME	OCCUPATION
AB 04	K	STUDENT
AB 05	S	STUDENT
AB 11	P	STUDENT
AB 15	G	STUDENT

AB 16	R	STUDENT

                                                            [4]

(iii) Describe the effects of using computer for MIS.   **[7]**

8. (i) Describe the duties of Certifying Authority.   **[5]**
    (ii) List the main goals of E-commerce.   **[4]**
    (iii) Describe the term "Secure System".   **[2]**
    (iv) Define Executive Information System and list the special features of an EIS. **[4]**
    (v) List the salient features of a WAN.   **[3]**