Paper 9 – Operations Management & Information Systems

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Full Marks: 100   **Time allowed: 3 hours**

Section – A

I. **Answer the following questions which is compulsory:**

1. **Answer any five of the following questions:**   **[5×2=10]**

    (a) Define efficiency
    (b) List the application of PERT
    (c) Define Quality Circle
    (d) What is meta - data?
    (e) Define entropy.
    (f) Mention any two reasons for spread of e-commerce.
    (g) What is iconic scale model?

2. **Match the following:**   **[5×1=5]**

	List A		**List B**
A.	Load Control	(i)	Product Mix determination
B.	Linear Programming (LP)	(ii)	Transportation Application
C.	Vogel's Approximation Method (VAM)	(iii)	Bottleneck Centre
D.	Information	(iv)	Digital Signature
E.	Primary key	(v)	Refined data

3. **Statement whether the following statements are True / False:**   **[5×1=5]**

    (a) C++ is a programming language.
    (b) Critical path is the shortest path from beginning of the project to ending of the project.
    (c) An open system is a self contained one and normally a rigid one.
    (d) Memory is used to store data, program and results.
    (e) Industrial Engineering is a staff function.

4. **Fill in the blanks with one word or two:**   **[5×1=5]**

    (a) Efficieny = (_____ / actual hours) x 100.
    (b) Processed data is known as _____.
    (c) Database management is responsibility of _____.
    (d) _____ is a single purpose machine tools designed for cutting gears.
    (e) Expand MTBF _____.

Section – B

II. **Answer any three questions from the following:**   **[15×3=45]**

1. (a) The work-study engineer carries out the work sampling study for 120 hours. The following observations were made for a machine shop:

      Total number of observations   7000
      No. of Idle activities   1200

Ratio between manual to machine elements   3 : 1
Total number of jobs produced during study   800 units
Rest and personal allowances   17%

Compute the standard time for the job.   **[7]**

(b) A plant Manager is considering replacement policy to a new machine. He estimates the following costs

Year	1	2	3	4	5	6
Replacement cost at the beginning of the year	100	110	125	140	160	190
Salvage values at the end of the year	60	50	40	25	10	0
Operating Costs	25	30	40	50	65	80

Find the year when replacement is to be made.   **[8]**

2. **(a)** XYZ manufacturing company planning to start its production activities has to decide on the location of the plant. Three locations are being considered:

	Location A	Location B	Location C
Fixed costs (₹ Lakhs per annum)	35	55	30
Variable cost (₹ Per annum)	350	250	400

The expected sales price of the product is ₹750 per unit. Find out:
(A) The range of annual production / sales volume for which each location is most suitable, and
(B) Which one of the three is the best location at the production /sales volume of 22,000 units?
Clearly mention the assumptions, if any.   **[5]**

(b) A bakery keeps stock of a popular brand of cakes. Previous experience shows the daily demand pattern for the item with associated probabilities, as given:

Daily demand (no.s)	0	10	20	30	40	50
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 days.
Also find out the average demand per day
Random Numbers: 25, 39, 65, 76, 12, 05, 73, 89, 19, 49.   **[10]**

3. **(a)** State the eight most Common Benchmarking errors.   **[8]**

(b) From the following time series data of sale project the sales for the next three years.

Year	2009	2010	2011	2012	2013	2014	2015
Sales ('000 units)	80	90	92	83	94	99	92

Project the trend values for 2016, 2017 and 2018.   **[7]**

4. **(a)** A department works on 8 hours shift, 288 days a year and has the usage data of a machine, as given below:

Product	Annual Demand (units)	Processing time (Standard time in hours)
A	325	5.0
B	450	4.0
C	550	6.0

Calculate (a) processing time needed in hours to produce products A, B, and C, (b) Annual production capacity of one machine in standard hours, and (c) Number of machines required. **[8]**

(b) What are the objectives of maintenance management? **[7]**

Section – C

III. Answer any two question form the following: **[15×2=30]**

1. **(a)** Discuss about Prerequisite of an effective MIS. **[6]**
   (b) List the tangible benefits of ERP. **[5]**
   (c) What are the benefits and limitations of using flow charts? **[4]**

2. **(a)** Define EIS and List the special features of an EIS. **[2+5=7]**
   (b) Explain various SET operators used in DBMS. **[8]**

3. **(a)** List the advantages & disadvantages in E- commerce. **[8]**
   (b) Explain different types of database backups. **[7]**