PAPER 9 - OPERATIONS MANAGEMENT & INFORMATION SYSTEM

The following table lists the learning objectives and the verbs that appear in the syllabus learning aims and examination questions:

	Learning objectives	Verbs used	Definition
LEVEL B	KNOWLEDGE What you are expected to know	List	Make a list of
		State	Express, fully or clearly, the details/facts
		Define	Give the exact meaning of
	COMPREHENSION What you are expected to understand	Describe	Communicate the key features of
		Distinguish	Highlight the differences between
		Explain	Make clear or intelligible/ state the meaning or purpose of
		Identity	Recognize, establish or select after consideration
		Illustrate	Use an example to describe or explain something
	APPLICATION How you are expected to apply your knowledge	Apply	Put to practical use
		Calculate	Ascertain or reckon mathematically
		Demonstrate	Prove with certainty or exhibit by practical means
		Prepare	Make or get ready for use
		Reconcile	Make or prove consistent/ compatible
		Solve	Find an answer to
		Tabulate	Arrange in a table
	ANALYSIS How you are expected to analyse the detail of what you have learned	Analyse	Examine in detail the structure of
		Categorise	Place into a defined class or division
		Compare and contrast	Show the similarities and/or differences between
		Construct	Build up or compile
		Prioritise	Place in order of priority or sequence for action
		Produce	Create or bring into existence

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) Explain the term Operations Design.**
   (b) A work study practitioner who conducted a work sampling study assesses the activity level of a worker to be 65%. During the space of 8 hours working, this worker turns out 300 components. If the company policy is to inflate the normal time arrived at by work sampling study by 20%, what should be the allowed time per unit?
   (c) 'Capacity available and capacity required are measured in the following time span"- List the plans.
   (d) Explain the term Aggregate Planning.
   (e) Explain the term Predictive Maintenance.
   (f) State the meaning of Technology Fusion.
   (g) State the Software Packages which serve as aids in program analysis.
   (h) Describe Conceptual Schema.
   (i) List the reasons for failure of an ERP project.
   (j) Define 'Verify' in relation to a digital signature. **[10 × 2 = 20]**

Operations Management

Answer any three questions

2.(a) (i) XYZ Scientific Equipment manufacturing company is engaged in producing different types of high class equipment for use in science laboratories. The company has two different assembly lines to produce its most popular product. The processing time for each of the assembly lines is regarded as a random variable and is described by the following distributions:

Processing time (minutes)	Assembly A_1	Assembly A_2
20	0.20	0.10
21	0.40	0.15
22	0.20	0.40
23	0.15	0.25
24	0.05	0.10

Using the following random numbers, generate data on the process times for 15 units of the item and compute the expected process time for the product:

3441, 7674, 4349, 4383, 8311, 1519, 0236, 4594, 1554, 0575, 8900, 8008, 2874, 2434, 0993

For the purpose, read the numbers horizontally, taking the first two digits for the processing time on assembly A_1 and the last two digits for processing time on assembly A_2. [10]

(ii) Distinguish between PERT and CPM. [6]

(b) (i) Draw network. Determine the critical path and duration of the project. Find total float for each activity. (Duration in days)

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

[14]

(ii) Customers arrive at a booking office window being manned by a single individual at a rate of 25 per hour. The time required to serve a customer has exponential distribution with a mean of 120 seconds. Find the average waiting time of a customer. [2]

(c) (i) The data on the operating costs per year and resale prices of equipment A whose purchase price is ₹1,00,000 are given here:

Year	1	2	3	4	5	6	7
Operating Cost (₹)	15,000	19,000	23,000	29,000	36,000	45,000	55,000
Resale value (₹)	50,000	25,000	12,500	6,000	4,000	4,000	4,000

(a) What is the optimum period for replacement?

(b) When equipment A is 2 years old, equipment B, which is a new model for the same usage, is available. The optimum period for replacement is 4 years with an average cost of ₹36,000. Should we change equipment A with that of B? If so, when? [10]

(ii) State the six basic concepts required for TQM. [6]

(d) (i) Solve the following Assignment problem. The data given in the table refers to production in units:

	Machines			
Operators	A	B	C	D
1	10	5	7	8
2	11	4	9	10
3	8	4	9	7
4	7	5	6	4
5	8	9	7	5

[12]

(ii) For a certain element of work, the basic time is established to be 20 seconds. If for three observations, a time study observer records ratings of 100,125 and 80 respectively, on a '100 normal scale' what are the observed timings? [4]

Information System

Answer any two questions.

3. (a) (i) Explain the different activities involved in system conversion. [5]
(ii) Describe Transform Analysis. [3]
(iii) Explain the different types of end users. [5]
(iv) List the advantages of coding information. [3]

(b) (i) 'ERP is not confined to manufacturing only but covers all facets of organization".-list them. [2]
(ii) Describe the major characteristics of Transaction Processing System. [4]
(iii) List the intangible benefits of ERP. [3]
(iv) List the steps to be followed for establishment of MIS in an organization. [7]

(c) (i) State the notable features of the Information Technology Amendment Act, 2008. [6]
(ii) Explain the term Electronic Financial Transaction. [4]
(iii) State the uses of Electronic Data Interchange. [2]
(iv) Describe the set up of General Ledger master data. [4]