

**PAPER 6: SYSTEM ANALYSIS DATA PROCESSING AND QUANTIATIVE TECHNIQUES
NOVEMBER 1998**

Question 1 is compulsory.

Answer any four from the remaining six questions.

Question 1

- (a) What are the major constraints in operating the MIS? Discuss them briefly. **(5 Marks)**
- (b) Information requirements depend upon various factors. What are these factors? Discuss them. **(5 Marks)**
- (c) A Company has three operational departments (Weaving, processing and packing) with capacity to produce three different types of clothes namely suitings, shirtings and woollens yielding the profit Rs. 2, Rs. 4 and Rs.3 per meter respectively. One meter suiting requires 3 minutes in weaving , 2 minutes in processing and 1 minute in packing. Similarly one meter of shirting requires 4 minutes in weaving, 1 minute in processing and 3 minute in packing while one meter woollen requires 3 minute in each department. In a week total run time of each department is 60,40,and 80 hours for weaving, processing and packing departments respectively.
Formulate the linear programming problem to find the product mix to maximize the profit. **(10 Marks)**

Question 2

- (a) (i) What is an application software? **(2 Marks)**
(ii) Enumerate the advantages of pre-written application software packages. **(2 Marks)**
(iii) Discuss the factors upon which “make or buy” decision of an application software Depends? **(3 Marks)**
(iv) Before Purchasing the packaged software on what features the software will be assessed? **(3 Marks)**
- (b) ABC Company is engaged in manufacturing 5 brands of packed snacks. It is having five manufacturing setups, each capable of manufacturing any of its brands, one at a time, The cost to make a brand on these setups vary according to following table:

| | S1 | S2 | S3 | S4 | S5 |
|----|----|----|----|----|----|
| B1 | 4 | 6 | 7 | 5 | 11 |
| B2 | 7 | 3 | 6 | 9 | 5 |
| B3 | 8 | 5 | 4 | 6 | 9 |
| B4 | 9 | 12 | 7 | 11 | 10 |
| B5 | 7 | 5 | 9 | 8 | 11 |

Assuming, five setups are S1, S2, S3,S4 and S5 and five bands are B1, B2.B3,B4 and B5.

Find the optimum assignment of products on these setups resulting in the minimum cost. **(10 Marks)**

Question 3

- (a) Draw a diagram depicting the flow of information for computerized production scheduling system and explanation the following :
(i) System interfaces.
(ii) Files and inputs.
(iii) Output Reports. **(10 Marks)**
- (b) A super market has a single cashier. During the peak hours, customers arrive at a rate of 20 Customers per hour. The average number of customers that can be processed by the cashier is 24 per hour. Calculated :
(i) The probability that the cashier is idle.
(ii) The average number of customers in the queuing system.

- (iii) The average time a customer spends in the system.
- (iv) The average number of customers in the queue.
- (v) The average time a customer spends in the queue waiting for service. **(10 Marks)**

Question 4

- (a) What measures are to be taken by the top management to protect data and program? also explain the various controls, necessary to ensure data communication security. **(10 Marks)**
- (b) ABC Enterprises is having three plants manufacturing dry cells, located at different locations. Production cost differs from plant to plant. There are five sales offices of the company located in different regions of the country. The sales prices can differ from region to region. The shipping cost from each plant to each sales office and other data are given by the following table:

| Production Data Table | | |
|--------------------------|-------------------------------|-----------|
| Production cost per unit | Max. capacity in no. of units | Plant no. |
| 20 | 150 | 1 |
| 22 | 200 | 2 |
| 18 | 125 | 3 |

Shipping Cost and Demand & Sales Prices Table

Shipping Costs

| | Sales Office 1 | Sales Office 2 | Sales Office 3 | Sales Office 4 | Sales Office 5 |
|---------|----------------|----------------|----------------|----------------|----------------|
| Plant 1 | 1 | 1 | 5 | 9 | 4 |
| Plant 2 | 9 | 7 | 8 | 3 | 6 |
| Plant 3 | 4 | 5 | 3 | 2 | 7 |

Demand & Sales Prices

| | | | | | |
|-------------|----|-----|----|----|-----|
| Demand | 80 | 100 | 75 | 45 | 125 |
| Sales Price | 30 | 32 | 31 | 34 | 29 |

Find the production and distribution schedule most profitable to the company.

Question 5

- (a) What are the major reasons for the development of methods standards and performance standards? Discuss them briefly **(10 Marks)**
- (b) A Bakery keeps stock of popular brand of bread. Previous experience indicates indicates the daily demand as given below:

| | | | | | | |
|--------------|------|------|------|------|------|------|
| Daily demand | 0 | 10 | 20 | 30 | 40 | 50 |
| Probability | 0.01 | 0.20 | 0.15 | 0.50 | 0.12 | 0.02 |

Consider the following sequence of random numbers: 48, 78, 19, 51, 56, 77, 15, 14, 68, 9.

Using above sequence, simulate the demand for the next 10 days.

- (i) Find out the stock if the owner of the bakery decides to make 30 breads everyday.
- (ii) Estimate the daily average demand for the bread on the basis of simulated data.

Question 6

- (a) Explain briefly the principal duties of a chief systems analyst and a programmer. **(10 Marks)**
- (b) A small assembly plant assembles PCs through 9 interlinked stages according to following precedence/ process:

| Stage from to | Duration (Hours) |
|---------------|------------------|
| 1-2 | 4 |

| | |
|-----|----|
| 1-3 | 12 |
| 1-4 | 10 |
| 2-4 | 8 |
| 2-5 | 6 |
| 3-6 | 8 |
| 4-6 | 10 |
| 5-7 | 10 |
| 6-7 | 0 |
| 6-8 | 8 |
| 7-8 | 10 |
| 8-9 | 6 |

- i. Draw an arrow diagram (network) representing above assembly work. **(2 Marks)**
- ii. Tabulate earliest start, earliest finish, latest start and latest finish time for all the stages. **(4 Marks)**
- iii. Find the critical path and the assembly duration. **(2 Marks)**
- iv. Tabulate total float, free float and independent float. **(2 Marks)**

Question7

- (a) Write short notes on the following:
 - (i) Editing tests to check the validity of data. **(5 Marks)**
 - (ii) Security risks associated with personal computers. **(5 Marks)**
- (b) Write comparison between:
 - (i) Hurwicz and Wald criterion for decision problems. **(5 Marks)**
 - (ii) PERT and CPM. **(5 Marks)**