

QP Code : 31371

(3 Hours)

Total Marks: 80

N.B. 1) Question No.1 is compulsory.

- 2) Attempt any three questions out of the remaining five questions.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever required but justify the same.

Q1. Attempt any four (20)

- A. Why there is a need for PPC department?
- B. What are the reasons for storing the inventory?
- C. What are the problems faced in case of lack of product planning?
- D. What is ABC analysis?
- E. What are the factors influencing scheduling?

Q2. A. What are the different types of manufacturing methods? (10)

B. What is a work order? How is it prepared in different manufacturing methods? (10)

Q3. A. A company wishes to assign 4 salesmen to 4 districts. The volume of sales matrix is given below. Make the optimal assignment which results in maximum volume of sales. (10)

Salesmen	Districts			
	A	B	C	D
1	250	300	420	400
2	350	400	200	250
3	500	375	400	350
4	400	350	420	300

B. There are seven jobs which are to be pressed first on machine M - I and then on machine M - II. Processing times in hours are given below. Find the optimal sequence and total elapsed time. Find the idle time on machine M - II. (10)

Job	A	B	C	D	E	F	G
M - I	6	24	30	12	20	22	18
M - II	16	20	20	13	24	2	6

Q4. A. Universal tooling has a requirement for 1,50,000 metal bushings per annum. The company orders the metal bushings in lots of 40,000 units from a supplier. The ordering cost is Rs. 40 and the carrying charges are expressed 20% of the unit cost. The bush cost Rs. 1.5 each. The company wants to know what percentage of their order quantity differs from economic order quantity and how the cost varies for the two. Find the optimal order quantity. (10)

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B. What are the assumptions in Linear Programming? (10)

A kitchen manager at a hospital has to decide the food mix for the patients. Dietary instructions are that each patient must get at least, one gm. of protein, one gm. of fat and 3 gms. of carbohydrates. Additional instructions are that in no case the carbohydrate should exceed 6 gms. per patient.

The availability of protein, fat, and carbohydrate in gms. per kg of chicken, rice and bread is given as follows,

	Protein	Fat	Carbohydrates	Price/kg
Chicken	10	2	0	30
Rice	2	1	15	5
Bread	2	0	10	4

Formulate a suitable mathematical model for the above diet mix assuming 100 patients on that day.

Q5. A. A project is composed of the following activities whose time estimates are given below, (10)
(estimated activity duration in weeks)

Activity	Optimistic	Most Likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

- Draw the network and find the critical path.
- Find the expected duration and variance for each activity.
- Calculate the standard deviation of project length.

B. What is the importance of a process sheet? What details does a process sheet contain? (10)

Q6. Write Short Notes on:- (20)

- PPC as an integrated approach
- ERP
- Computer Aided Process Planning
- Dispatching