

- Instruction :** (i) Attempt any THREE questions in Section-I.
(ii) Section-II is a compulsory section of short questions.
(iii) Notations are usual everywhere.
(iv) The right hand side figures indicate marks of the sub question.

SECTION-I

Attempt any THREE of the following questions:

- Q-1 (a) Discuss Economic Order Quantity (EOQ) Model with finite replenishment rate. [7]
(b) Using the EOQ model with constant rate of demand obtain EOQ and the total variable cost associated with policy of ordering quantities of that size. Annual demand=10,000 units, ordering cost=Rs. 40 per order and inventory carrying cost is 20% of average inventory value.
- Q-2 (a) Discuss Economic Order Quantity (EOQ) model with constant rate of demand. [7]
(b) A company plans to consume 760 pieces of a particular component. Pat records Indicates that the purchasing department spent Rs. 12,555 for placing 15,500 Purchase orders. The average inventory was valued at Rs. 45,000 and the total Storage cost was Rs. 7650 which included wages, taxes, rent, insurance etc. related to the store department. The company borrows capital at the rate of 10% per year. If the price of component is Rs. 12 and the lot-size is 10, find the following :
(1) Purchase price per year (2) Purchase expenses per year (3) Storage expenses per year
(4) Capital cost per year (5) Total cost per year. [7]
- Q-3 (a) Compare and contrast CPM and PERT. Under what conditions would you recommend scheduling by PERT? Justify your answer with reasons. [7]
(b) Draw an arrow diagram showing the following relationships. [7]

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	--	--	--	A,B	B,C	A,B	C	D,E,F	D	G	G	H,J	K	I,L

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Q-4 (a) Discuss various steps involved in the applications of PERT and CPM. [7]

(b) An established company has decided to add a new product to its line. It will buy the product from a manufacturing concern, package it, and sell it to a number of distributors selected on a geographical basis. Market research has indicated the volume expected and the size of sales force required. The steps shown in the following table are to be planned : [7]

Activity	Description	Time (Weeks)
A	Organize sales office	6
B	Hire salesmen	4
C	Train salesmen	7
D	Select advertising agency	2
E	Plan advertising campaign	4
F	Conduct advertising campaign	10
G	Design package	2
H	Setup packaging facilities	10
I	Package initial stocks	6
J	Order stock from manufacturer	13
K	Select distributors	9
L	Sell to distributors	3
M	Ship stocks	5

Q-5 (a) Explain the two person zero sum game giving a suitable example. [7]

(b) Let the payoff matrix is as follow :
$$\begin{bmatrix} 40 & -80 \\ 15 & -20 \\ 20 & 50 \end{bmatrix}$$

Determine optimal strategies and value of the game. [7]

Q-6 (a) Explain Dominance Principle in Game theory. [7]

(b) Solve the following game whose payoff matrix is given by :
$$\begin{bmatrix} 3 & -1 & 4 & 6 & 7 \\ -1 & 8 & 2 & 4 & 12 \\ 16 & 8 & 6 & 14 & 12 \\ 1 & 11 & -4 & 2 & 1 \end{bmatrix}$$
 [7]

SECTION-II

Q-7 Answer any FOUR of the followings in short: [8]

(I) Give types of direct inventory.

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- (II) Explain any two cost involved in inventory problem.
- (III) Give types of indirect inventory.
- (IV) Give full form of the notation "ROL", "R", "PC", "A".
- (V) Define: Spare parts inventories
- (VI) Define Predecessor activity and Successor activity

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