[This question paper contains.4 printed pages.]

5184-N *Your Roll No.....*

B.Sc. Prog./Sem. II **B**

MATHEMATICAL SCIENCES

Paper OR–2 – Inventory Systems and Marketing Management

(For Admissions of 2011 and onwards)

Time : 3 Hours *Maximum Marks : 75*

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any **five** *questions.*
Calculators are allowed.

1. (a) What are the advantages and disadvantages of Increased Inventory ? Briefly explain the objectives that must be fulfilled by an Inventory control system. (6)

   (b) Explain the various costs that are involved in Inventory analysis, how are they interrelated. (6)

   (c) What are the different types of Inventories. (3)

P.T.O.

2. (a) The production department of a company requires 3,600 kg of raw material. Ordering cost is Rs. 36/ order, I = 25%, Cost = Rs. 10/kg. Find out EOQ, T*, K(Q) and Total Variable Cost. (7)

(b) Formulate an optimal order policy when Demand is finite and deterministic short ages are allowed and fully backlogged. Production rate is instantaneous. Lead time is zero. (8)

3. (a) Explain All unit discount model in Inventory. Find the optimal order quantity for following price breaks

Quantity range	Price range
$0 \leq Q < 800$	Rs. 1.00
$800 \leq Q$	Rs. 0.98

Demand = 1600 units/year

A = Rs. 5/order

I = 10% of unit cost (7)

(b) For a time dependent, discrete Inventory model, find out the best ordering policy when demand is probabilistic

x	0	10	20	30	40	50	60
p(x)	0.10	0.15	0.20	0.25	0.15	0.10	0.05

(8)

4. (a) How has marketing changed in the last 10 years, how can operations Research approach help the marketing managers. (5)

(b) What is direct and derived demand ? Describe the factors affecting demand. (4)

(c) How is Market classified with respect to competition ? (6)

5. (a) What is brand switching & show that the market reaches a steady state, also give the assumptions of Brand switching.

	A	B
A	0.7	0.3
B	0.5	0.5

(5)

(b) State and prove Elasticity theorem. (5)

(c) Derive the condition for joint optimization of Advertising budget, keeping Quality and selling price fixed. (5)

6. (a) Formulate a Media Allocation problem as a Linear Integer programming problem. (8)

(b) What are pricing decisions, how is the market price of a commodity set in practice. (7)

P.T.O.

7. (a) Formulate any general production scheduling model in Inventory and give the outline for the optimal solution. (8)

(b) Explain in Marketing

(i) Arc Elasticity

(ii) Marginal Revenue

(iii) Demand function (7)