

## CHOICE BASED CREDIT SYSTEM

M.Com. THIRD SEMESTER DEGREE EXAMINATION DECEMBER 2023

Management Science

Duration:3 Hours

Max Marks:70

I. Answer any THREE of the following :

(3×5= 15 Marks)

1. What are the different models used in Management Science?
2. An advertising company wishes to plan its advertising strategy in three different media- television, radio and magazines. The purpose of advertising is to reach as large a number of potential customers as possible. Following data have been obtained from market survey:

Strategies	Television	Radio	Magazine-I	Magazine-II
Cost of an advertising company	Rs.30,000	Rs.20,000	Rs.15,000	Rs.10,000
No.of potential customers reached per unit	2,00,000	6,00,000	1,50,000	1,00,000
No.of female customers reached per unit	1,50,000	4,00,000	70,000	50,000

The company wants to spend not more than Rs.4,50,000 on advertising. Following are the further requirements that must be met:

- (i) at least 1 million exposures take place among female customers.
- (ii) advertising on magazines be limited to Rs.1,50,000
- (iii) at least 3 advertising units be bought on magazine I and 2 units on magazine II
- (iv) the number of advertising units on television and radio should each be between 5 and 10.

Formulate an L.P model for the problem.

3. Determine basic feasible solution to the following transportation problem using North west Corner rule.

		Sinks					Supply
		A	B	C	D	E	
Origins	P	2	11	10	3	7	4
	Q	1	4	7	2	1	8
	R	3	9	4	8	12	9
Demand		3	3	4	5	6	

4. The following details are available in respect of a firm.

- a. Annual usage 7500 units
- b. Carrying costs per item for one year, Rs.1
- c. Ordering Cost Rs.75 per order

Determine the Economic Order Quantity.

II. Answer the following question :

(1×10= 10 Marks)

5. Solve the given linear programming problems graphically:

Maximize:  $Z = 50x + 15y$

and the constraints are :  $5x + y \leq 100,$

$x + y \leq 50,$

$x \geq 0, y \geq 0$

III. Answer any THREE of the following :

(3×15= 45 Marks)

6. Discuss the origin and development of Operations Research. What are the limitations of OR?  
How computer has helped in popularising OR?

7. Consider the following transportation problem with the given cost matrix:

Warehouse	Depot					Supply
	D1	D2	D3	D4	D5	
A	4	1	2	6	9	100
B	6	4	3	5	7	120
C	5	2	6	4	8	140
Demand	40	50	70	90	90	

Required:

1. Find the initial feasible solution using VAM method.
2. Test the optimality and find the optimal solution (under MODI method).

8. Use the simplex method to solve the following LP problem

$$\text{Maximize } Z = 3x + 5y + 4z$$

Subject to constraints

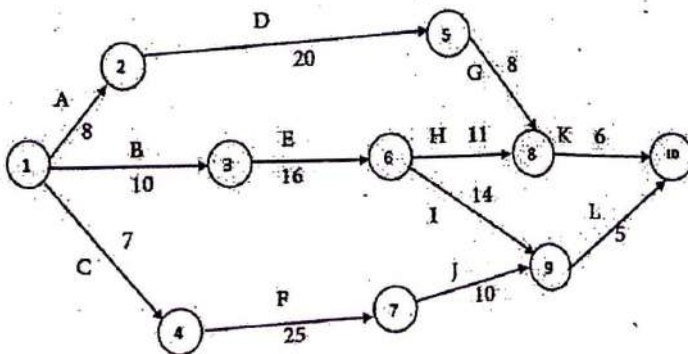
$$3x + 2y \leq 8$$

$$2x + 3y \leq 10$$

$$3x + 2y + 4z \leq 15$$

And.  $x, y, z \geq 0$

9. Find out the completion time and the critical activities for the following project:



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**CHOICE BASED CREDIT SYSTEM****M.Com. THIRD SEMESTER DEGREE EXAMINATION DECEMBER 2023****Research Methodology****Duration:3 Hours****Max Marks:70****I. Answer any THREE of the following :****(3×5= 15 Marks)**

1. Define 'Research Design'. Write a note on 'Random Replication Design'.
2. Define 'Research'. Describe the criterias of good research.
3. Explain 'Primary Data'. Mention the various methods of collecting Primary data.
4. Differentiate between systematic sampling and stratified sampling techniques.

**II. Answer the following question :****(1×10= 10 Marks)**

5. Tupperware India Pvt. Ltd. is a wholly owned subsidiary of the US-based Tupperware Corporation, the world's leading manufacturer of high-quality plastic food storage and serving containers. The company started its operations in India in 1996 and the country was recognized as the fastest growing market by Tupperware worldwide. Starting off with just 12 products, Tupperware India today sells over 70 products to meet Tupperware's stringent international quality standards. The company's turnover in 2016 was over US\$ 11.5 million. Tupperware India has specially designed tailor made products for the Indian home makers to fulfill the unique needs of the Indian Kitchen.

Tupperware India at present faces competition from stainless steel utensils and low end plastic products both available at retail outlets across India. However with increasing awareness of high-end food storage containers, the company see itself up against more intense competition. Already compainies like Modi Care, Cutting Edge and Real Life have entered this segment with lower prices.

The company needs your consultancy to analyze the effectiveness of its direct selling method to reach its customers. It seeks to understand the perception of consumers and dealers consultants. Hence, comment on the following questions.

- a. What would be the research problem in this case? (2.5 marks)
- b. What are the objectives of the study? (2.5 marks)
- c. Explain the methods that you will use to collect the data for the study? (2.5 marks)
- d. What is the likely outcome of this study? (2.5 marks)

**III. Answer any THREE of the following :****(3×15= 45 Marks)**

6. Explain the different steps involved in a research process.
7. Explain the following scales with examples:
  - a) Likert scale.
  - b) Semantic differential scale.
  - c) Interval scale.
8. Briefly explain the uses of T-test and Z-test in data analysis and interpretations?
9. Explain the contents of a 'Research Report'. Also, elaborate the kinds of research reports.

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**CHOICE BASED CREDIT SYSTEM****M.Com. THIRD SEMESTER DEGREE EXAMINATION DECEMBER 2023****Futures and Options****Duration:3 Hours****Max Marks:70****I. Answer any THREE of the following : (3×5= 15 Marks)**

1. Explain the concept of OTC derivatives.
2. Explain the types of parties involved in Call Options.
3. From the following calculate Valuation of Option through Binomial Model.

Current market price = Rs. 500

Exercise price = Rs. 510

Time = 1 year

Risk free rate = 10% p.a.

Option = Call

uS and dS = 20%

4. Evaluate the characteristics of Equity Swaps.

**II. Answer the following question : (1×10= 10 Marks)**

5. a) Explain the concept of unsystematic risk in the context of diversification. (5)
- b) Calculate VaR for 1 day and 10 days at 5% l.o.s assuming value of the portfolio Rs.200,000 with standard deviation at 10% p.a. (5)

**III. Answer any THREE of the following : (3×15= 45 Marks)**

6. Discuss the importance and role of 'Clearing House'.
7. "A put option can be used to protect the profit accrued on a share". Explain.
8. a) "Derivatives gives new insights and approaches of Risk Management". Comment. (10)
- b) Also, describe the features of Futures contracts. (5)
9. "A currency swap requires exchange of the principal amount as well as of the interest as both the principal and interest payments are subject to foreign exchange risk". Discuss.

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## CHOICE BASED CREDIT SYSTEM

M.Com. THIRD SEMESTER DEGREE EXAMINATION DECEMBER 2023

Predictive Modeling and Marketing Analytics

Duration:3 Hours

Max Marks:70

I. Answer any THREE of the following :

(3×5= 15 Marks)

1. Explain the advantages of 'Predictive Modeling'.
2. Explain 'Random Forest'.
3. A company owns a lease on a certain property. It may sell the lease for Rs 12000 or it may drill the property for oil. Various possible drilling results are as under along with the probability of happening and rupee consequences:

Possibilities of result	Probabilities	Rupee consequences
Dry well	0.10	-100,000
Gas well only	0.40	45,000
Oil and Gas combination	0.30	98,000
Oil well only	0.20	1,99,000

Draw a decision tree diagram and calculate EMV for the act drill, Should the company drill or sell?

4. The forecasted sale for B Ltd in 2022 was Rs. 60,00,000, and the actual sale for 2022 was Rs. 55,00,000. The alpha value is 0.4. Calculate sales for the year 2023 using the exponential smoothing approach.

II. Answer the following question :

(1×10= 10 Marks)

5. From the given set of data, find out frequent item set and apply association rules. Assume minimum support is 3.

Transaction ID	Items
T1	{E, K, M, N, O, Y}
T2	{D, E, K, N, O, Y}
T3	{A, E, K, M}
T4	{C, K, M, U, Y}
T5	{C, E, I, K, O, O}

III. Answer any THREE of the following :

(3×15= 45 Marks)

6. What is 'Supervised Learning'? Explain the functions of 'Supervised Learning'.
7. What is meant by 'Overfitting'? Explain the causes of 'Overfitting'.
8. Describe PESTEL market analysis.
9. What is RFM analysis? Explain with an example.