



QP CODE: 25050582



Reg No :

Name :

MSc DEGREE (CSS) EXAMINATION DECEMBER 2025

First Semester

M Sc OPERATIONS RESEARCH AND COMPUTER APPLICATIONS

Core Courses - CE020103 - DECISION ANALYSIS

2019 Admission Onwards

OCC1D436

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

Answer any **eight** questions.

Weight 1 each.

1. What is meant by hurwicz criterion?
2. What is meant by expected utility?
3. How can calculate EVSI?
4. How to obtain the base estimator in a zero one loss function?
5. Define the term Risk.
6. What is chance node and decision node?
7. Describe decision strategy.
8. Explain Marginal Analysis.
9. Explain conjugate prior with an example.
10. Explain sampling from Poisson population.

(8×1=8 weightage)

Part B (Short Essay/Problems)

Answer any **six** questions.

Weight 2 each.

11. Explain payoff table.
12. The following is a payoff (in rupees) table for three strategies and two state of nature

Strategy	State of Nature	
	N1	N2
S1	40	60
S2	10	-20
S3	-40	150





Select a strategy using following decision criteria

- a) Maximax
- b) Maximin

13. Explain posterior distribution.
14. Differentiate between cardinal and ordinal utility.
15. Define:
 1. Risk
 2. Folding Back
 3. Equivalent Risk
16. What is meant by course of action?
17. Explain posterior probability with an example
18. A poll of 100 voters chosen at random from all voters in a given district indicated that 55% of them were in favor of a particular candidate. Suppose that prior to the poll we believe that the true proportion of voters in that district favoring that candidate has a uniform density over the interval $[0, 1]$. Find the posterior density of θ .

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. The daily demand of cars for hiring in a city is as follows:

Demand:	12	13	14	15	16
Probability:	0.2	0.1	0.3	0.3	0.1

The parking charge per car is Rs.100 per day if a car is not hired. For hiring a car, the company gets Rs. 250 rent per car per day. if a car is hired, the company does not have to pay parking charges. The company wants to enter into business in the city. Construct a payoff table and determine how many cars the company should have, based on EMV criterion.

20. A T.V dealer finds that the cost of a T.V in stock for a week is Rs.30.00 and the cost of a unit shortage is Rs. 70.00. For one particular modal of T.V the probability distribution of weekly sales is as follows:

weekly sales:	0	1	2	3	4	5	6
Probability :	0.10	0.10	0.20	0.25	0.15	0.15	0.05

 How many units/week should the dealer order? Also, find EVPI

21. The Oil India Corporation (OIC) is considering whether to go for an offshore oil drilling contract to be awarded in Bombay High. If OIC bid, value would be Rs.600 million with a 65% chance of gaining the contract. The OIC may set up a new drilling operation or move already existing operation which has proved successful, to a new site. The probability of success and expected returns are as follows:

Outcome	New Drilling Operation		Existing Operation	
	Probability	Expected Revenue (Rs. Millions)	Probability	Expected Revenue (Rs. Millions)
Success	0.75	800	0.85	700
Failure	0.25	200	0.15	350





If the Corporation do not bid or lose the contract, they can use RS.600 million to modernize their operation. This would result in a return of either 5 percent or 8 percent on the sum invested with probabilities 0.45 and 0.55. (Assume that all costs and revenue have been discounted to present value.)

1. Construct a decision tree for the problem showing clearly the course of action.
 2. By applying an appropriate decision criterion recommend whether or not the Oil Indi Corporation.
22. a) Explain the methods of measuring utility
- b) Corporation XYZ is considering an investment which would utilise all its funds available for investment. The researches expect either of the two instantaneous events to occur, with the results shown in the table below:

Event	Conditional net monetary value	Probability of event
A	10,00,000	0.70
B	-50,000	0.30

Assume that the firm has a utility function which may be approximated as follows:

$$U = -0.001 Y^2 \quad \text{if } Y < -1,500$$
$$= Y, \quad \text{if } Y > 1,500$$

- (a) Is it desirable to undertake the venture on the basis of the assumed utility function?
- (b) What would be the decision if the expected payoff criterion is used?

(2×5=10 weightage)

