Internal Assesment Test - III

Sub:	OPERATIONS RESEARCH						Code:	20MBA24
Date:	15-09-2022	Duration:	90 mins	Max Marks: 50	Sem: II	Branch:	MBA	

		Marks	OBE	
			CO	RBT
Part A - Answer Any Two Full Questions (2* 20 = 40 marks)				
1 (a)	Summarize the term Decision Theory.	[03]	CO3	L2
(b)	Categorize the different decision theory.	[07]	CO3	L4
(c)	Assess the environment in which decisions are made in Decision Theory.	[10]	CO3	L5
2 (a)	Describe the term Maximin.	[03]	CO3	L2
(b)	Calculate the Expected Value and write your comments.	[07]	CO3	L3

An investor is given the following investment alternatives and percentage rates of return.

	States of Nature		
	Low	**Medium**	**High**
Regular Shares	2%	5%	8%
Risky Shares	-5%	7%	15%
Property	-10%	10%	20%

Over the past 300 days, 150 days have been medium market conditions and 60 days have had high market increases.

On the basis of these data, state the optimal investment strategy for the investor.

(c)	A businessman has 2 options to sell his products. He can set up a showroom in the city or can sell from his factory outlet. Setting up a showroom will cost Rs. 3, 00,000 with a 60% probability of success.	[10]	CO3	L3

If the showroom succeeds he can get a net profit of Rs. 8, 00,000 per year. If it fails, he can close the showroom or rent it out for an annual rent of Rs. 2, 40,000 (for the rest of the year). The probability of getting rent is 80%.
If he sells from the factory outlet, he has to incur Rs. 50,000 as renovating charges. The chances of successful selling here is 40% with a net profit of Rs. 4,00,000 per year.

      a) What would you advise the businessman to do?

      b) Advise the businessman on how a decision tree helps him to make a decision.

3 (a)	Define the term Network Tree.	[03]	CO4	L1

(b) The Rs. 8, 00,000 property of the Goodwill India Co has one tenth of one percent chance of catching fire that will cause damage to the property to the extent of Rs. 1,00,000 and one twentieth of one percent chance of catching fire that will completely destroy the property. The management of the company decides to insure the property and is reviewing two alternative insurance policies: [07] CO3 L3

       a) A policy with Rs. 50,000 deductible that is the insurance company covers all losses expect the initial Rs. 50,000. The annual premium for such a policy is known to be one tenth of one percent of the value of the property.

       b) A no-deduction policy with full compensation having an annual premium of Rs. 1,000.

If the company's objective is cost minimization, which policy should it opt for? Sketch both the payoff table and the opportunity loss table for the situation and solve both of them.

(c) The time estimates (in weeks) for the activities of a PERT network are given below: CO4 L3 [10]

Activity		Completion time (Weeks)		
Event	Event	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

       a) Draw up the project network and identify all the paths thereby.

       b) Determine the expected project length.

       c) Calculate the standard deviation and variance of the project length.

       d) What is the probability that the project will be completed?

          i. Atleast 4 weeks earlier that the expected time?

          ii. Not more than 4 weeks later than the expected time?

       e) If the project due date is 19 weeks, what is the probability of not meeting the due date?

       f) What is the probability that the project will be completed within the schedule i.e. 20 weeks?

       g) Find the project duration at 90% probability.

Part B - Compulsory (01*10=10 marks)

4 **Case Study**

From the following data relating to a project.   [10] CO4 L4

       a) Find the expected duration, standard deviation and variance of

each activity.

b) Draw up the project network diagram and trace out all the possible paths there from.
c) Find the expected project length.
d) Find the probability that the project will be completed within 30 weeks.
e) Calculate the Esr, Eft, Lst and Lft values for each activity. Also, find the total float for all the activities.

Activity		Name of the Activity	Duration		
Event	Event		Optimistic	Most Likely	Pessimistic
(1)	(2)	(3)	(4)	(5)	(6)
1	2	A	1	1	7
1	3	B	3	5	7
1	4	C	2	2	8
2	5	D	1	1	1
3	5	E	3	6	9
4	6	F	2	5	8
5	6	G	4	6	14
6	7	H	6	8	10
5	7	I	3	7	11

	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5
CO1:	Get an insight into the fundamentals of Operations Research and its definition, characteristics and phases.					
CO2:	Use appropriate quantitative techniques to get feasible and optimal solutions.					
CO3:	Understand the usage of game theory, Queuing Theory and Simulation for Solving Business Problems.	1a, 2a		1b, 2b, 3b	1c, 2c	
CO4:	Understand and apply the network diagram for project completion.	3a			3c, 4	

Cognitive level	KEYWORDS
L1 - Remember	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
L2 - Understand	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
L3 - Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
L4 - Analyze	classify, outline, break down, categorize, analyze, diagram, illustrate, infer, select
L5 - Evaluate	asses, decide, choose, rank, grade, test, measure, defend, recommend, convince, select, judge, support, conclude, argue, justify, compare, summarize, evaluate
L6 - Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

PO1–*Theoretical Knowledge;* PO2–*Effective Communication Skills;* PO3–*Leadership Qualities;* PO4 –*Sustained Research Orientation;* PO5 –*Self-Sustaining Entrepreneurship*

CI   **CCI**   **HOD**

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<u>**Scheme of Evaluation**</u>
<u>**Internal Assessment Test 3– Sep 2022**</u>

Sub:	OPERATIONS RESEARCH			Code:	20MBA24
Date: 15-09-22 Duration: 90mins Max Marks: 50		Sem: IV	Branch:		MBA

Note: Part A - Answer Any Two Full Questions (20*02=40 Marks)

Part B - Compulsory (01*10= 10marks)

Part	Question #		Description	Marks Distribution	Max Marks
A	1	a)	Definition of Decision Theory.	3	20 M
		b)	Categorize the different decision theory Mentioning only the Points Explaining the points with examples.	4 3	
		c)	Assess the environment in which decisions are made in Decision Theory Mentioning only the Points Explaining the points with examples.	4 6	
	2	a)	Explain the term Maximin.	3	20 M
		b)	Assigning the points Calculating the values Computation of Optimal investment.	2 2 3	
		c)	Computation of Decision Options Computation of profit.	5 5	
	3	a)	Definition of Network Tree.	3	20 M
		b)	Categorize the different decision theory Mentioning only the Points Explaining the points with examples.	2 2 3	
		c)	Computation of Network Path. Computation of Floats. Computation of Project Duration.	3 3 4	
B	4		Computation of Network Path. Computation of Floats. Computation of Project Duration.	5 5	10 M

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Internal Assesment Test – III

Sub:	OPERATIONS RESEARCH						Code:	20MBA24
Date:	15-09-2022	Duration:	90 mins	Max Marks:	50	Sem:	I	Branch: MBA

SOLUTION

		Marks	OBE CO	OBE RBT
	Part A - Answer Any Two Full Questions (2* 20 = 40 marks)			
1 (a)	Decision theory Decision theory (or the theory of choice; not to be confused with choice theory) is a branch of applied probability theory concerned with the theory of making decisions based on assigning probabilities to various factors and assigning numerical consequences to the outcome.	[03]	CO1	L1
(b)	Categorize the different decision theory There are two branches of decision theory – Normative Decision Theory and Optimal Decision Theory. There are three different types of uncertainty that can be found in decision-making theory –States, Consequences, and Actions.	[07]	CO1	L2
(c)	Assess the environment in which decisions are made in Decision Theory The ability to predict the outcome of the choices available is essential to make the right decision. The steps involved in the decision-making process are: ➢ Define the Problem ➢ Determine Requirements ➢ Establish Goals ➢ Identify Alternatives	[10]	CO2	L3
2 (a)	Maximin maximize one's own minimum gain.	[03]	CO2	L2
(b)	Low = 0.15 Medium = 0.17 High = 0.20	[07]	CO2	L3
(c)	Showroom = Rs. 6,92,000 Factory outlet = Rs. 1,30,000	[10]	CO2	L4

3 (a)	Network Trees Three parameters are crucial in determining the statistics of random tree networks, first, the branching probability, second the maximum number of allowed progenies at each branching point, and third the maximum number of generations, that a tree can attain. There are a lot of studies that address the large tree networks, however small tree networks are seldom studied	[03]	CO2	L1

(b)

M1	J1	J4	J5	J2	J3	M2

[07]   CO2   L2

Total Elapsed time = 72 hours

Idle time for M2 = 37 & Idle time for M3 = 15.

(c) Total Project duration = 17 weeks, SD = 3, Variance = 9, 9%, 91%, 74.86%, 84.13% and 21 weeks.   [10]   CO2   L2

Part B - Compulsory (01*10=10 marks)

4   SD = 2.1643 & Variance = 4.6862

Z = 1.85, 96.78%.   CO2   L4

	Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5
CO1:	Gain conceptual knowledge and practical experience in understanding the HR concepts globally.					
CO2:	Comprehend and correlate the strategic approaches to HR aspects amongst PCN's, TCN's and HCN's.					
CO3:	Develop knowledge and apply the concepts of HR in global perspective.	1a, 2a		1b, 2b, 3b	1c, 2c	
CO4:	Have a better insight of HR concepts, policies and practices by critically analyzing the impact of contemporary issues globally.	3a			3c, 4	

Cognitive level	KEYWORDS
L1 - Remember	list, define, tell, describe, recite, recall, identify, show, label, tabulate, quote, name, who, when, where, etc.
L2 - Understand	describe, explain, paraphrase, restate, associate, contrast, summarize, differentiate interpret, discuss
L3 - Apply	calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model, experiment, show, examine, modify
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L6 - Create	design, formulate, build, invent, create, compose, generate, derive, modify, develop, integrate

PO1–_Theoretical Knowledge;_ **PO2–**_Effective Communication Skills;_ **PO3–**_Leadership Qualities;_ **PO4 –**_Sustained Research Orientation; PO5 –Self-Sustaining Entrepreneurship_

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