Sanjay Ghodawat University, Kolhapur

2018-19

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Year and Program:2018-19, SY MBA	**School of commerce and Management**	**Department: Management**
Course Code: MMC BA618	**Course Title: Decision and Risk Analytics (DRA)**	**Semester – Even**
Day and Date: Thursday 30/5/2019	**End Semester Examination**	**Time: 3 hrs, Max Marks: 100** 2.30 to 5.30 pm.

Instructions: 1) All Questions are compulsory.

		Mks	COs	Blooms level
Q.1	Answer the following			
a)	To improve production capacity and avoid downtime, a global biotechnology manufacturing company implemented mathematical tools. The company's quarterly operations review revealed a 3.6% increase in downtime during production. This downtime stemmed from an unexplained viscosity in one product in the production line. The resulting pipeline blockages led to more frequent equipment cleaning procedures and stoppage during the batch production, high levels of waste, a decreased capacity, and lengthened time to market. Analyze given caselet and present a appropriate predictive analytics solution	10	CO1	L4
b)	Embracing the power of Advanced Predictive Analytics to provide differentiated and personalized customer experience is essential. Using a holistic analytical marketing approach and a comprehensive CRM strategy will support decision making, optimization and automation across different marketing activities and CRM operations in financial institutions. Combine Enterprise Data, Big Data, Social Media, Text Analytics and Social Network Analysis to predict major CRM events and resolve issues using Advanced Predictive Analytics applications for Marketing and Banking. Validate the requirement and application of predictive analytics in field of Financial services and Marketing in with reference to given information	10	CO2	L6
	OR			
b)	In the Advertising Media Mix example problem, the aim was to minimize advertising costs, while meeting goals of reaching a minimum total audience for each channel, and not exceeding a budgeted number of ad impressions. To break this down into a solvable model, first an Objective was defined, a formula for calculating advertising costs that solver will minimize. Then		CO2	L6

Constraints, formulas calculating the total audience reached and the number of ad impressions generated and defined. The Constraints also included a lower limit for the total audience and an upper limit for ad impressions. The Inputs or known values are the target audience sizes for each channel, the cost per impression and the max impressions. The Decisions or Variables in this example are the amounts to invest in each channel. To associate the needed optimization elements to Solver format, the Solver task pane Model tab is used. Further, the three needed optimization elements defined in the spreadsheet are entered to map them to the Solver under Objective, Variables and Constraints to be able to find a solution.

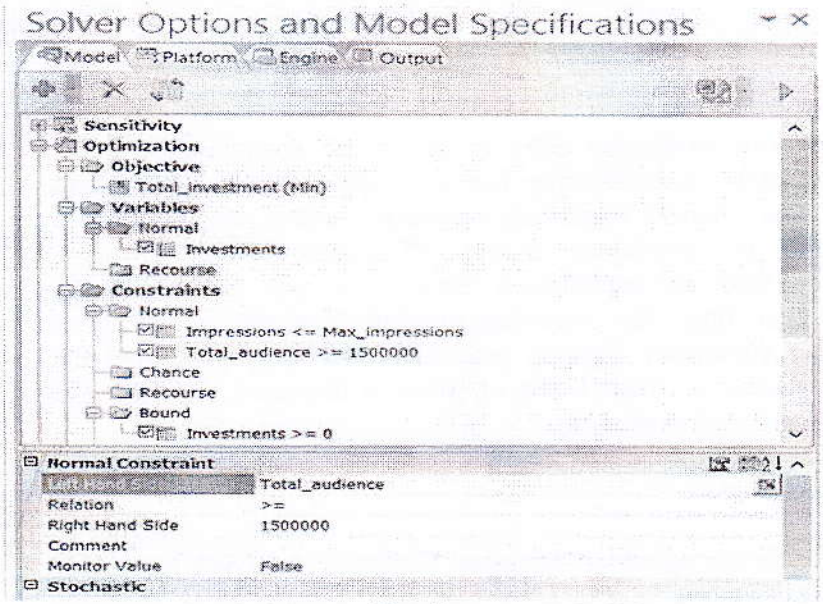

Fig.1b.

Develop a Mathematical Optimization Model referring given information and Fig.1b.

Q.2 Answer the following

a)	Design a Network Modeling for a "Student Database" and write characteristics, structure and relationship of it	10	CO3	L6
b)	A supply chain is a complex network which involves the products, services and information flows between suppliers and customers. A typical supply chain is composed of different levels, hence, there is a need to optimize the supply chain by finding the optimum configuration of the network in order to get a good compromise between the multi-objectives such as cost minimization and lead-time minimization. There are several optimization methods which have been applied to find the optimum solutions set based on the Pareto	10	CO4	L3

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front line. In this study, a swarm-based optimization method, namely, the bees algorithm is proposed in dealing with the multi-objective supply chain model to find the optimum configuration of a given supply chain problem which minimizes the total cost and the total lead-time. The results show that the proposed bees algorithm is able to achieve better Pareto solutions for the supply chain problem.

Examine which modeling technique would be suitable for a complex networking in supply chain. Further explain how?

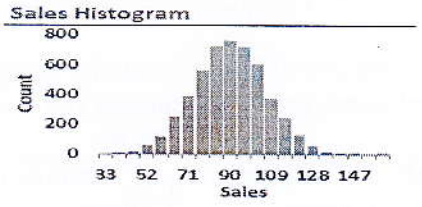
OR

b) 10 CO4 L3

Monte Carlo Forecast

Projected Net Profit	
Sales	87
COGS	34
Gross Profit	53
Operating Expense	42
Profit Before Taxes	11
Taxes	3
Net Profit	8

Key Percentiles		
Percentile	Sales	Profits
25%	76	3
50%	87	8
75%	98	14
100%	159	46
Loss Percentile	17%	



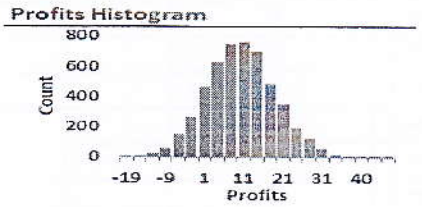


Fig.2b.

Interpret above sketch in Fig.2b. of Monte Carlo Simulation as a tool to judge investment decision and improve business practices and profitability.

Q.3 Answer the following

a) Determine Critical path and Total duration of a project for the Table.3a. Perform calculations wherever required. 10 CO5 L3

Table.3a.

Task	Title	Duration (Days)	Predecessor
A	Design	7	-
B	Build	6	A
C	Test	5	A(FS=2)
D	Implement	2	B (SS=4)
E	Deploy	11	C
F	Prototype	8	D
G	Reengineering	4	B,E (FS=3)
H	Demonstration	9	F,G

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OR

a) Illustrate different Quantitative Forecasting Models from a business and financial analysts point of view to predict future revenues, expenses, budget and capital cost for a business. 10 CO5 L3

Q.4 Answer the following

a) Demonstrate prioritization of individual risks for a given Table.4a. and draw the P-I matrix 10 CO6 L3

Table.4a.

Risk ID	Risk Events
1.1.1	Incomplete decision analysis
1.1.2	Unclear probability distribution and values
1.2.1	Poor analytical requirements
1.3.1	Complexity in forecasting and modeling

b) Measure success and failure probability using PERT technique for Table.4b. and assess individual success and failure rate of each task. 10 CO6 L4

Table.4b.

Task	t_o (Optimistic Time)	t_p (Pessimistic Time)	t_m (Main Time)
0 → 1	9	4	3
1 → 3	4	5	2
3 → 4	6	7	1
4 → 6	5	2	2
0 → 2	2	3	6
2 → 5	1	8	9
5 → 6	7	9	5
2 → 3	8	2	8

c) Estimate Expected Monetary Value (EMV) for all Risk events to help make decisions for each possible outcome and figure out cost of Contingency Reserve with the help of Table.4c. 10 CO6 L2

Table.4c.

Risk Events	Probability (P)	Impact (I)
Incomplete decision analysis	25%	Cost $950 to recover the damage
Unclear probability distribution and values	15%	Cost $200 for alternative analysis
Poor analytical requirements	35%	Save $1800 in prescriptive testing
Complexity in forecasting and modeling	30%	Cost $1500 to carry out forecasting methods

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OR

c) In order to identify Risk Scores and severity, describe Risk Breakdown Structure (RBS) for specific analytical risks and address them using both categorical and numerical scales. 10 CO6 L2

Q.5 Answer the following

a) Sketch a Network diagram for Table.5a. and determine Free Float (FF), Total Float (TF) and critical activities for the same. 10 CO5 L3

Table.5a.

Activity	Duration	Predecessor
A	8	-
B	4	A
C	2	A
D	6	B
E	5	C
F	3	D
G	9	B,E
H	7	F,G

b) Discuss the procedure of initial project scoping to evaluate total duration of a single task in relation to project of your choice. Corroborate your answer with WBS, Project deliverables, Work packages and its rules. 10 CO5 L2

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