VPM's
DR VN BRIMS, Thane
Programme: MMS (2016-18)
Second Semester Examination April 2017

Subject	OPERATION RESEARCH		
Roll No.		Marks	60 Marks
Total No. of Questions	7	Duration	3 Hours
Total No. of printed pages		Date	27.04.2017

Note: Q1 is compulsory and solve any FOUR from the remaining SIX questions.

Q1) 20 Marks (Compulsory)
a) Draw an organizational pyramid the way it was done in the class. Show the level of decisions normally taken at three levels: S, T, O. State the type of data required & used in each level is internal or external. Mark which area would normally be handling structured data and which area would be unstructured data. State Sending Report is "bottom-up" or "top down" activity.
b) Explain the terms   i) information content
                                          ii) Sensitivity Analysis
c) Differentiate between continuous function and discrete function. Give examples.
d) Draw and explain
i) A line passing through the origin and making an angle of 45 degrees with +ve x axis. What is the slope of this line?
ii) A line passing through the origin and making an angle of 135 degrees with +ve x axis. What is the slope of this line?

Attempt Any FOUR from the Remaining SIX Questions

Q2) *Any two from (a) or (b) or (c)* -- *(5x2) = 10 Marks*
a) Compare Qualitative and Quantitative analysis. Give examples. State their use. When would I opt for each?
b) Compare Data with information & Primary data with secondary data. Give examples.
c) In decision theory what do you understand by "E.M.V." (Expected Monetary Value)? How would you use this value is decision making.

Q3) *Any two from (a) or (b) or (c)* -- *(5x2) = 10 Marks*
a) Write notes on: Administrative Model of Decision Making
b) What do you understand by: "Cognitive dissonance"?
c) Herbert Simon Model of Decision Making divides the process of decision making into 3 phases:
    i.   Intelligence Phase
    ii. Design Phase
    iii. Choice Phase
Explain in details any <u>one</u> Phase.

Q4) *Any two from (a) or (b) or (c)* -- *(5x2) = 10 Marks*
a) Explain what you understand by C.S.F., what is K.P.I.? Explain the C.S.F. /K.P.I. method?
b) Explain the following term used in transportation problem where xij to be the number of units shipped from supply center i to demand center j.

$$\min \sum_{}^{m} \sum_{}^{n} x_{ij} c_{ij}$$

B

c) Write and explain a similar term for limitation on supply and limitation on demand. What would happen if the demand is more than supply?

Q5) *Any two from (a) or (b) or (c) -- (5x2) = 10 Marks*

a) In the assignment problem we came across the word "Bijection". Expllain what do you understand by it. Compare it with "surjective" & "injective"

b) In the game theory what do you understand by "Zero Sum Game". Is it necessary that each player should know about each others strategy before the game starts? What is the "value of the game"?

c) What is "payoff matrix"? Explain if a_{ij} represents the pay-offs (gain for A) for the ith action and j^{th} action of B the strategy of either player. Define saddle point.

Q6) *Any two from (a) or (b) or (c) -- (5x2) = 10 Marks*

a) Distinguish between (only within the scope of Queueing theory)
   - i)   Poisson Distribution
   - ii)   Exponential distribution

b) Explain the words (within the scope of Queueing theory) (any two)
   - i)   Balking:
   - ii)   Renege
   - iii)   Jockeying

c) As per Kendal's notation, explain what does thede terms mean to you:
$$M \, / \, M \, / \, 1 \, : \, /\infty/\infty$$

Q7) *Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks*

a)   The average time of 9 minutes between two consecutive arrivals. The length of a telephone call with mean 3 minutes.
   - i)   Calculate the arrival rate   = λ
   - ii)   Calculate the service rate = μ
   - iii)   Calculate the probability that a person arriving at the booth will have to wait.

b)   What is a decision tree? How is it a useful tool in the corporate world? Give example and explain.

c)   Managers need to take decisions under the following three conditions. i) Certainty ii) uncertainty and iii) risk. Differentiate & Give examples of each.