28-04-2009

Decision Science (Elective)
MMS II sem

DS02

Total No Of Questions:7 | Total No Of Printed Pages :3
Duration (hrs) : 3 | Maximum Marks: 60

NB: 1) Attempt any five questions
2) Figures to the right of the question indicates full marks
3) Graph paper and statistical table will be provided on request

Q 1. A. what is decision making? Enumerate briefly the steps in decision making process?

(5)

B. a management is faced with the problem of choosing one of the product for manufacturing. The probability matrix after market survey for the two products was as follows.

	State of nature		
	Good	Fair	Poor
Act			
Product A	0.75	0.15	0.10
Product B	0.60	0.30	0.10

The profit that the management can make for different levels of market acceptability of the product are as follows

	State of nature Profit (in Rs) if market is		
	Good	Fair	Poor
Act			
Product A	15000	15000	5000
Product B	50000	30000	loss of 3000

Calculate expected value of the choice of alternative and advise the management.

(7)

Q.2 A. Define with an example
i) Competitive game
ii) Pay off matrix.
iii) Pure and mixed strategies

(4)

B. Two firms are competing for business under condition so that one firms gain is another firms loss. A's pay of matrix is given below.

	Firm B		
Firm A	No Advertising	Medium Advertising	Heavy Advertising
No Advertising	10	5	-2

Medium Advertising	13	12	13
Heavy Advertising	16	14	10

Suggest the optimal strategies for two firms and the net outcome there of.

(8)

Q3 A. Describe single equation model in brief. Also state BLUE property of OLS estimator. When ILS & 2SLS methods are used ?

(5)

B. Intermediate results are based on a sample of 10 observation are given as follows (deviation firms)

	y	x_1	x_2
y	1310	834	63
x_1		620	-110
x_2			608

mean of Y = 1030 mean of X_1 = 108 mean of X_2 = 100
fit a regression of Y on X_1 and X_2

(7)

Q 4 A. What is multicollinearity? How do you detect multicollinearity?
Explain the concept of Auto Co-relation

(6)

B. Estimate the following model using WLS method

Y_i	:	6	7	9	10	11
X_i	:	4	8	6	8	7
Var (ui)	:	4	6	3	5	4

(6)

Q5 A. Define time series. Explian the components of time series in series

(4)

B. Calculate the Trend Values by moving average method and hence find seasonal indices by simple average method (Use multiplicative Model)

Quarterly Data

Year	I	II	III	IV
2000	8	16	24	32
2001	48	36	24	12
2002	48	16	32	64
2003	72	108	144	36
2004	56	28	84	112

(8)

Q 6 Answer any two

i. Decision tree
ii. Hetroscedacity
iii. Graphical method to solve two person zero sum game.
iv. Forecasting method

(12)

Q 7 Solve any two

i. Given GDP (Y) and GNP (X) in hundred crores of rs. For a period of 15 years. The estimated regression function is obtained as

$\hat{Y} = 37.00152 + (0.17395)X$

S.E; (76.26112) (0.05406)

$R^2 = 0.5641$ $t_{0.05} = 2.201$

Evaluate the function on the basis of R^2 and t statistic

ii. . Below are the figures of production (thousand tons) of a sugar factory.

Year :	2000	2001	2002	2003	2004
Production: (thousand tons)	700	600	400	900	900

Fit a second degree curve and estimate the production for 2005

iii. A glass factory specializing in crystal is developing a substantial backing and the firm's management is considering the 3 courses of actions. Arrange for sub contracting (S_1) begin overtime production (S_2) and construct new facilities (S_3). The correct choice depends largely upon future demand which may be low, medium or high. By consensus management ranks the respective probabilities as 0.10, 0.50 and 0.40. a cost analysis reveals effect upon the profit that is shown as

		Course of action		
Demand	Probability	S_1	S_2	S_3
Low (L)	0.10	10	-20	-150
Medium (M)	0.50	50	60	20
High (H)	0.40	50	100	200

Show the decision situation in the form of a decision tree and indicate most preferred decision and corresponding expected value.

(12)
