DS02

Decision Science

Total No Of Questions:7   Total No Of Printed Pages :3
Duration (hrs) : 3   Maximum Marks: 60
Date : April 2010

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

Q1 A) Explian the terms
      i) EMV
      ii) EOL   (4)

B) A Company is considering the introduction of a new product to its excisting
product range. It has defined two levels of sales as 'high' and 'low' on which to base its
decision and has estimated the changes that each market level will occur, together with
their cost and consequent profits or losses.The information is summarized below

State of nature	probability	Courses of action	
		Market the product (in Rs)	Do not market the product (in Rs)
High Sales	0.3	150	0
Low Sales	0.7	-40	0

The company's manager suggests that a market research survey may be undertaken to
provid further information. On past experience with a certain market research
organization the marketing manager assesses its ability to give good information in the
light of subsequent actual sales achievement as follows

Market research	Actual Sales	
	Market High	market low
High Sales forecast	0.5	0.3
Indecisive survey report	0.3	0.4
Low sales forecast	0.2	0.3

The market research will cost Rs 20000. State whether or not there is a case for
employing the market research organization

                                                                      (8)

Q2 A) Explain the theory of dominanace in the solution of reactangular games?

                                                                      (4)

B) Solve the following problem of game graphically

Player B

Player A	1	3	-3	7
	2	5	4	-6

(8)

Q3 A) Describe single equation model in brief. Also state BLUE property of OLS estimator.

(4)

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

(8)

Q4 A) What is multicollinearity? How do you detect multicollinearity?

(4)

B) State the condition when WLS method is used.
For the following data Estimate the model using WLS method taking Demand as dependent variable

Di:	10	20	23	25	42
Pi	8	7	6	4	3
Var (ui)	1	4	5	2	1

Where D : Demand, P: price and Var (ui) variance of disturbance term

(8)

Q5 : A) What are the components of time series? State atleast one example of each component

(4)

B) From the following data, estimate the trend value by taking 4 yearly moving averages also calculate the Seasonal, Cyclical & Irregular fluctuations by using Multiplicative Model.

Year :	1995	1996	1997	1998	1999
Sales (Rs Lakhs):	400	240	560	480	320

Year :	2000	2001	2002	2003	2004
Sales (Rs Lakhs):	640	720	800	640	720

(8)

Q6   Answer any two.
   1) Hetroscedacity
   2) Autocorrelation
   3) Decision tree
   4) Forecasting methods   (12)

Q7) Solve any two
   1) The following are the residuals of a two variable model. Compute D.W. statistic 'd' & test for the presence of Auto Correlation.

Year	et
2000	2.26
2001	1.71
2002	2.27
2003	3.09
2004	1.55
2005	0.35
2006	-0.92
2007	-1.9
2008	-2.58

Lower limit of 'd' = 1.08
Upper limit of 'd' = 1.36

2) Fit a second degree curve for the following data and estimate for 2010

Year:	2004	2005	2006	2007	2008
Production (thousand tons)	8	12	15	7	8

3) 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, the 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 as follows

Outcome	New drilling operation		Existing drilling operation	
	Probability	Expected Returns (Rs millions)	Probability	Expected Returns (Rs millions)
Success	0.75	800	0.85	700
Failure	0.25	200	0.15	350

If the corporation do not bid or loose the contract, they can use Rs 6000 million to modernize their operation. This would result in a return of either 5 % or 8 % on the sum invested with probabilities 0.45 and 0.55. Construct a decision tree and draw the conclusion.

              (12)