March 2013

Master of Business Administration (MBA) Examination

I Semester

Mathematics and Statistics for Managers

Time 3 Hours] [Max. Marks 80

Note : Attempt any five questions with a minimum of two questions from each section. All questions carry equal marks.

Section I: Business Mathematics

1. (a) In an industry comprising 100 finns, the number of firms committing drop-error, go-error, no error and both the errors are in the ratio 9:8:6:3. Find the number of firms committing: (i) drop-error only (ii) both the errors.

   (b) If the Cost function and Revenue function of the firm that produces and sells x units of its brand are given by :
   $C(x) = 5.x + 350$ and RCt) $= 50x - x^2$ respectively.
   Find : (i) The break even point, (ii) The qxiantum of production that fetches profit.

2. (a) If $y = e^x . x^2 + e^{2x}$, find $\frac{dy}{dx}$

   (b) Find the value of $\int_1^4 \sqrt{X}\, dX$

3. (a) Evaluate :

$$\lim_{x\to\infty} \frac{4x^3 - 3x^2 + x}{6x^3 - 3x^2 - 2x + 5}$$

   (b) Discuss the continuity of function $f(x) = \frac{1}{-2}$ at $x = -2$.

4. (a) Solve by the Cramer's rule :
   $x - y - z = 1 = y - z - x = z - x - y$.

   (b) Find the extreme values of the function :
   $y = x^3 - 6x^2 + 9x - 8$.

Section II: Business Statistics

5. (a) Write a note on application of Statistics in Business and Management.

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   (b) Define the following event with example :
   (i) Mutually exclusive events
   (ii) Exhaustive events
   (iii) Independent event
   (iv) Dependent event.

6. (a) Is there any fallacy in the statement ? The mean of a binomial distribution is 20 and its standard deviation is 7.

   (b) What is Poisson distribution ? Give examples where it can be applied.

7. (a) The coefficient of Rank Correlation of marks obtained by 10 students in English and Mathematics was found to be 0.5. It was later discovered that the difference in ranks in two subjects obtained by one of the students was wrongly taken as 3 instead of 7. Find the correct coefficient of rank correlation.

   (b) A student obtained the two regression equations as $2X - 5Y - 7 - 0$ and $3X + 2Y - 8 = 0$: Do you agree with him?

8. (a) Find out the seasonal fluctuations by the method of Moving Averages from the following data :

Year	Summer	Monsoon	Autumn	Winter
1976	30	81	62	119
1977	33	104	86	171
1978	42	153	99	221

   (b) Calculate the expected opportunity loss from the following pay off table and hence decide which act is to be selected :

	Acts			
Events	A	B	C	D
S_1	50	20	-10	-20
S_2	120	50	200	300
S_3	200	240	400	350

Tne probabilities of the events are 0.2, 0.5 and 0.3 respectively.

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