Roll No
6600 38/40/30/20

N-218

January - February 2019

Master of Business Administration (MBA) Examination

First Semester (Full Time)

MATHEMATICS AND STATISTICS FOR MANAGERS

Time 3 Hours] [Max. Marks 80
[Min. Marks 32

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

Section A

1. (a) In a Managers' club, 45 play Polo, out of which 30 play Polo only 28 play Snookers, 25 play Tennis, of which 11 play Tennis only, 7 play Tennis and Polo, but not Snooker. 5 play Polo and Snooker, but not Tennis :
   (i) How many play all the three sports ?
   (ii) How many play Snooker only ?
   (iii) How many members are there in the club ?
   (b) The cost (C) of producing 'x' units is given by the relation :
   $$C = 100 + 2x + \frac{25}{x}.$$
   What is the cost producing the 11 item ?
2. (a) Evaluate $\lim_{x \to 2} \left(\frac{\sqrt{3+x} - \sqrt{7-x}}{x^2 - 4} \right)$
   (b) A manufacture can sell x units per week at a price, $p = (20 - 0.001\,x)$ rupees each when it costs $C = (5x + 2000)$ rupees to produce x units. Determine the number of items he should produce per week for maximum profit.
3. (a) Find $\frac{dy}{dx}$ if $x = \frac{3at}{(1+t^2)}$ and $y = \frac{3at^2}{(1+t^2)}$.
   (b) Find the integral of $\left(\frac{x^2+2}{x+1} \right)$
4. (a) If $A = \begin{bmatrix} -2 & 1 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -1 \\ 2 & 3 \end{bmatrix}$. Find C.
   (b) Find A^{-1} for $A = \begin{bmatrix} 3 & 5 & -4 \\ 2 & -3 & 1 \\ -1 & 4 & 6 \end{bmatrix}$.

Section B

5. (a) Discuss the meaning and scope of statistics and explain the utility of maintaining statistics in industrial and commercial concerns.
   (b) State four main characteristics of statistical data and discuss limitations of statistics.
6. (a) A and B play a game in which A's chance of winning is 2/3. In a series of 8 games what is the probability that A will win 6 or more games ?
   (b) If X follows Poisson distribution such that P (X = 2) = 9 P (X = 4) + 90 P (X = 6), find the mean and variance of X.
7. (a) Calculate coefficient of correlation by ranking method :

X Series	:	70	60	50	30	40	55	63	79	80	72
Y Series	:	10	10.6	12	9.0	9.2	9.5	9.7	11.0	12.4	10.2

   (b) The following data relates to the height (X) and weight (Y) of 1000 business executives : Mean height ($\overline{X}$) = 68", mean weight ($\overline{Y}$) = 150 labs standard deviation ($\sigma_X = 2.5"$, $\sigma_Y = 20$ lbs correlation (r) = 0.6. Estimate :
   (i) The height of an executive whose weight is 100 lbs.
   (ii) The weight of an executive where height is 5 ft.

P. T. O.

8. (a) Calculate seasonal variation and index of the following :

Months	Jan	Feb	March	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2002	62	68	60	53	44	34	21	37	45	31	65	60
2003	59	69	51	38	36	16	8	11	11	17	12	22
2004	35	17	10	20	31	36	26	30	23	29	30	26

(b) What are the various elements in decision making ?