SS – 353

I Semester B.Sc. Examination, November/December 2018
(CBCS) (2014-15 and Onwards) (Repeaters)
STATISTICS – I
Basic Statistics – I

Time : 3 Hours   Max. Marks : 70

Instructions : i) Answer **any five** sub-divisions from Section – **A**, **five** sub-divisions from Section – **B** and **five** questions from Section – **C**.
ii) *Scientific calculator may be* **allowed**.

SECTION – A

I. Answer **any five** questions :   (5×2=10)

1) a) Distinguish between classification and tabulation.

 b) What is frequency distribution ? Express the Struges formula for computing class intervals and number of classes.

 c) Distinguish between discrete variable and continuous variable.

 d) Define Arithmetic mean. Mention its merits.

 e) Define axiomatic approach to the probability.

 f) If A and B are independent events, then prove that $\overline{A}$ and $\overline{B}$ are also independent.

 g) Define pair wise and mutual independence of events.

 h) State the Chebyschev' Inequality.

SECTION – B

II. Answer **any five** sub-divisions from the following :   (5×3=15)

2) a) Mention various methods of collecting primary data and explain one of them.

 b) Distinguish between nominal and ordinal scales.

P.T.O.

c) What is meant by classification ? Mention different types of classification.

d) Define geometric mean and harmonic mean.

e) Write an explanatory note on "Kurtosis".

f) For any two events A and B show that $P(\bar{A} \cap B) = P(B) - P(A \cap B)$.

g) Define conditional probability. If A and B are two events and $P(A) > P(B)$ then show that $P(A|B) > P(B|A)$.

h) If X is random variable such that $E(X) = 3$ and $E(X^2) = 36$, determine the upper bound of $P\{|x - 3| < 1\}$.

SECTION – C

III. Answer **any five** questions from the following :   (5×9=45)

3) a) Discuss the meaning and scope of Statistics.

   b) State the advantages of sampling over census.   (4+5)

4) a) Define median and mode. Mention their merits and demerits.

   b) Show that for two positive numbers :

   i) $AM \geq GM \geq HM$

   ii) $GM = \sqrt{AM*HM}$.   (4+5)

5) a) Obtain the expression for combined standard deviation for two series of data.

   b) Express the central moments in terms of raw moments of frequency distribution.   (4+5)

6) a) If A, B and C are mutually independent events then prove that $A \cup B$ and C are also independent.

   b) Define conditional probability and establish multiplication theorem of probability.   (6+3)

7) a) Define distribution function. Mention its properties and prove any one of them.

   b) If the probability mass function of the random variable X is $p(x) = x/3$ for $x = 0, 1, 2$, find (i) $E(X)$ (ii) $E(X^2)$ and (iii) $V(X)$.   (4+5)

8) a) If the probability density function of the random variable X is $f(x) = 3x(1-x)$ for $0 \le x \le 1$, find (i) E(X) (ii) V(X).

 b) If X is random variable such that $E(X) = 2$ and $E(X^2) = 10$, determine the lower bound for the probability $P(-3 < X < 9)$.   **(5+4)**

9) a) Write the syntax (**only one word**) for the followings :

 i) Generate 20 random numbers

 ii) Print number 10 five times

 iii) Number of units in the data set

 iv) Modify existing data file

 v) Clear screen.

 b) Explain with reference to R software :

 i) seq()

 ii) c()

 iii) length()

 iv) cd().   **(5+4)**

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