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F.Y. B.Sc.

STATISTICS

ST-111 : Descriptive Statistics-I

(2019 Pattern) (Semester - I) (Paper-I) (11171)

Time : 2 Hours]   *[Max. Marks : 35*

Instructions to the candidates:

1)   All questions are compulsory.

2)   Figures to the right indicate full marks.

3)   Use of calculator and statistical table is allowed.

Q1) A)   Choose the correct alternative from each of the following.   **[1 each]**

  i)   The unprocessed data is called_____

  a)   Raw data   b)   Secondary data

  c)   Processed data   d)   Formated data

  ii)   The odd order central moments of_____are zero.

  a)   Positively skewed distribution

  b)   Negatively skewed distribution

  c)   Symmetric distribution

  d)   Bernoulli distribution

  iii) With the help of ogive curve, one can determine

  a)   Median   b)   Mean

  c)   Mode   d)   Geometric Mean

 B)   State whether following statements are true or false.   **[1 each]**

  i)   CSO stands for Central Service Office.

  ii)   Honesty is an example of attribute.

Q2) Attempt any two of the following.   **[5 each]**

  a)   Define kurtosis and explain different types of it.

  b)   Distinguish between SRSWR and SRSWOR.

  c)   For two observations a and b arithmetic mean and geometric mean are 6.5 and 6. Find a and b also find harmonic mean.

P.T.O.

Q3) Attempt any two of the following. **[5 each]**

    a)   What is box plot. state its uses.

    b)   If $Q_{AB}=0$ then prove that $(AB)N=(A) (B)$.

    c)   Compute mean and coefficient of variation for the data given below. 54,61,64,69,58,56,49,57,55,50.

Q4) Attempt any one of the following. **[10 each]**

    a)   i)   Define raw and central moments. Express first four central moments in terms of raw moments. **[6]**

          ii)   Examine the consistency of data: **[4]**

                $N=100$, $(A)=30$, $(B)=80$, $(AB)=40$

    b)   i)   State and prove any two properties of arithmetic mean. **[6]**

          ii)   If $N=100$, $(A)=47$, $(B)=62$, $(AB)=32$ find the coefficient of association between A and B and interpret it. **[4]**

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F.Y.B.Sc.
STATISTICS
ST-112: Discrete Probability and Probability Distributions - I
(CBCS 2019 Pattern) (Semester - I) (Paper-II) (11172)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:
1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Use of statistical tables and calculator is allowed.*
4) *Symbols have their usual meaning.*

Q1) A) *Choose the correct alternative for the following:* **[1 each]**

i) If random variable (r.v.) X follows discrete uniform distribution on 1,2,3,.....,10 then mean of X is

a) $\frac{9}{4}$ b) $\frac{11}{2}$

c) $\frac{9}{2}$ d) $\frac{11}{4}$

ii) If X is discrete r.v. then

a) $E(X^2) \geq [E(X)]^2$ b) $E(X^2) = [E(X)]^2$
c) $E(X^2) \leq [E(X)]^2$ d) $E(X^2) \geq E(X)$

iii) If $P(A \cap B) = 0$, then the two events A and B are

a) exhaustive events

b) dependent events

c) mutually exclusive events

d) independent events

B) State whether the following statements are true or false: **[1 each]**

i) A discrete r.v. cannot take negative values.

ii) The variance of a r.v. is never negative.

Q2) Attempt any **Two** of the following: **[5 each]**

a) Define moment generating function(m.g.f) of r.v. X. State and prove its additive property.

b) Explain with one illustration each of the following.

   i) Equiprobable sample space.

   ii) Deterministic experiment.

   iii) Simple event.

c) If X and Y are independent binomial variates with $X \to B(5, \frac{1}{2})$ and $Y \to B(8, \frac{1}{2})$ find $p\left[\frac{X+Y}{2} \geq 1\right]$ and $P[X+Y=5]$.

Q3) Attempt any **Two** of the following: **[5 each]**

a) State and prove Baye's theorem.

b) Let $X \to B(n_1, p)$ and $Y \to B(n_2, p)$. Further X and Y are independent. Obtain the conditional distribution of X given X+Y= n.

c) The probability mass function(p.m.f.) of a r.v. is

$P(X=x) = Kx ; \quad x=1,2,3.$

$\quad\quad\quad = 0 ; \quad o.w.$

Find the value of K and variance of X.

Q4) Attempt any **ONE** of the following.

a) i) Define partition of sample space **[2]**

   ii) State properties of distribution function. **[4]**

   iii) Let A and B be two events defined on a sample space Ω such that

$P(A) = \frac{3}{4}$ and $P(B) = \frac{5}{8}$ then show that $\frac{3}{8} \leq P(A \cap B) \leq \frac{5}{8}$. **[4]**

b) i) Derive mean and variance of a discrete uniform distribution. **[5]**

   ii) A group of 20 cricket players contains 7 Maharashtrians and remaining non-Maharashtrians. An Indian team of 12 player's is to be formed. What is the probability that one fourth of the players in the team are Maharashtrians? **[5]**

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