

Faculty of Science**B.Sc (Statistics) I-Year, CBCS-I Semester Backlog Examinations -January, 2021****PAPER: DESCRIPTIVE STATISTICS AND PROBABILITY**

Time: 2 Hours

Max Marks: 80

I. Answer any **FOUR** of the following questions (4x20=80 Marks)

1. What are the measures of central tendency? Give an example for each.
2. Explain Sheppard's correction.
3. State and prove that addition theorem of probability for 'n' events.
4. State and prove Baye's theorem.
5. What is meant by a random variable. How many types of random variables? Define.
6. Derive Joint p.m.f and Joint P.d.f.
7. Show that i) $E(X+Y) = E(X)+E(Y)$ ii) $E(XY) = E(X) E(Y)$.
8. Define Moment generating function of a random variable X. Write down the properties of M.g.f

Faculty of Science
B.A/B. Sc (Statistics) I-Year, CBCS –I Semester
Backlog Examinations –June/July, 2022
PAPER: Descriptive Statistics and Probability

Time: 3 Hours

Max Marks: 80

Section-A

- I. Answer any EIGHT of the following questions (8x4=32 Marks)
1. Explain the Primary and Secondary data
 2. Define mode and explain its merits
 3. Define kurtosis and explain its types
 4. Define Random Experiment with an example
 5. If A and B are independents then show that A and B^C are independent
 6. State the baye's theorem and explain its application
 7. Define a Random variable and explain its properties
 8. Define independence of random variables
 9. State the properties of Bivariate distribution function
 10. Show that $E(XY) = E(X) E(Y)$ assuming that the random variables are discrete.
 11. Define MGF and state its assumptions
 12. If $\mu_1^1 = 4$, $\mu_2 = 6$ and $\mu_3 = 9$ then find the first four cumulants.

Section-B

- II. Answer the following questions (4x12=48 Marks)
- 13.(a) Explain the various measures of central tendencies in detail
(OR)
(b) Define moment and explain the relation between raw moments in terms of central moments
 - 14.(a) State and prove the Addition theorem of probability for 'n' events.
(OR)
(b) State and prove Boole's inequality
 - 15 (a) Let $f(x) = \frac{1}{2}$, $-1 < x < 1$
0, elsewhere
Be the p.d. f of the random variable x. Find distribution function and the p.d.f of $Y = X^2$
(OR)
(b) Define joint, marginal and conditional distribution functions of Bivariate random variables.
 - 16.(a) State and prove the Cauchy-Schwartz inequality and write its application
(OR)
(b) State and prove the Chebyshev's inequality

Faculty of Science
B. Sc (Statistics) I-Year, CBCS-I Semester Backlog Examinations –June, 2023
PAPER: Descriptive Statistics and Probability

Time:3 Hours.

Max Marks: 80

Section –AI. Answer any *Eight* of the following questions. (8x4=32 Marks)

1. Write short notes on Kurtosis.
2. Explain why we need for Sheppard's corrections and what are they.
3. CV=5; Karal Pearson's co-efficient of skewness = 0.54 and $\sigma = 2$. Find the mean and mode.
4. State and prove addition theorem of probability for two events.
5. Prove for any three events A,B and C then

$$P(A \cup B/C) = P(A/C) + P(B/C) + P((A \cap B) /C)$$
6. Write the statement of Baye's theorem.
7. Define Distribution function and write its properties.
8. Let X be a random variable with the following probability distribution

X=x	-3	6	9
P(X=x)	1/6	1/2	1/3

Find **E(X)** and **V(X)**

9. A continuous random variable X has a pdf,

$$f(x) = 3x^2; 0 < x < 1$$

$$= 0; \text{ Otherwise}$$

Find the pdf of **Y=2X**

10. Find the Co-Variance between ax and by, where cov(X,Y)=r.
11. Define Probability generating function and write its three properties.
12. Define Chebychive's inequality.

Section-B

II. Answer the following questions. (4X12=48 Marks)

13. (a) Define clearly all measures of Central tendency with suitable examples.
(OR)
- (b) Define Central and Non-Central Moments. Obtain the relation to express Central Moments in terms of Non-Central Moments
14. (a) State and prove Multiplication theorem of probability. If A and B are independent events then show that \bar{A} and \bar{B} are also independent events.
(OR)
- (b) State and prove Boole's inequality.
15. (a) Distinguish between p.m.f and p.d.f. Define joint probability distribution and discuss its properties.
(OR)
- (b) Let the joint probability density function of the random Variable X and Y be

$$f(x,y) = 2-x-y; 0 \leq x \leq 1$$

$$; 0 \leq y \leq 1$$

$$= 0; \text{ Otherwise.}$$

Find the marginal probability density functions and Conditional density functions of X and Y
16. (a) Define Cumulant generating function and derive the expression for the first four cumulants in terms of central moments.
(OR)
- (b) State and prove Cauchy –Schwartz's inequality
