

Statistics (Objective)

Paper (II)

Time Allowed:- 20 minutes

PAPER CODE 4181

Maximum Marks:- 17

Note:- You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Write PAPER CODE, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

1. The range of normal distribution is
(A) 0 to ∞ (B) $-\infty$ to 0 (C) $-\infty$ to $+\infty$ (D) 0 to n
2. The number of parameters of normal distribution is
(A) One (B) Two (C) Three (D) Four
3. The normal distribution has maximum ordinate at $X =$
(A) μ (B) σ (C) 1 (D) 0
4. The numerical value computed from sample is called
(A) Population (B) Statistic (C) Constant (D) Variable
5. In sampling without replacement
(A) $n \leq N$ (B) $n > N$ (C) $n \neq N$ (D) $N \leq n$
6. In sampling with replacement a sampling unit may appear in the sample
(A) Only once (B) More than once (C) Less than once (D) None of these
7. When $H_0: \mu \geq \mu_0$ then H_1 is
(A) $\mu \neq \mu_0$ (B) $\mu > \mu_0$ (C) $\mu < \mu_0$ (D) $\mu \leq \mu_0$
8. Which of the following is simple hypothesis
(A) $\mu < 15$ (B) $\mu > 15$ (C) $\mu \neq 15$ (D) $\mu = 15$
9. A specific value computed by using sample data is
(A) Estimator (B) Estimate (C) Estimation (D) Bias
10. In regression $\sum \hat{Y}$ is equal to
(A) 0 (B) $\sum Y$ (C) $\sum Y^2$ (D) bX
11. Two variables are uncorrelated then the value of r is
(A) -1 (B) 0 (C) +1 (D) Fractional
12. The sample correlation co-efficient is denoted by
(A) r (B) γ (C) β (D) θ
13. The strength of relation between attributes is
(A) Association (B) Correlation (C) Regression (D) +vely associated
14. The range of rank correlation co-efficient is
(A) -1 to 0 (B) 0 to 1 (C) -1 to +1 (D) $-\infty$ to $+\infty$
15. The graph of time series is called
(A) Historigram (B) Ogive (C) Scatter diagram (D) Histogram
16. The increased demand of air cooler in summer season is
(A) Trend (B) Seasonal (C) Cyclical (D) Irregular
17. Which of these is not output device
(A) Monitor (B) Scanner (C) Printer (D) Speaker

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2. Write short answer of any eight parts.

 $8 \times 2 = 16$

- (i) If $X \sim N(24, 16)$, then find quartiles Q_1, Q_2, Q_3 . (ii) If $X \sim N(15, 4)$, then find the value of Z if $X = 18$.
 (iii) Find maximum ordinate of the normal curve If $\sigma = 4$. (iv) Find the standard deviation for a normal distribution. If Quartile deviation is '6'. (v) Write any four properties of normal distribution. (vi) Define the term Estimation. (vii) What is meant by point estimator? (viii) What is meant by type-I error?
 (ix) Define the term test statistic. (x) What are the critical values for test statistic? (xi) What is Central Processing unit? (xii) What is a language translator?

3. Write short answer of any eight parts.

 $8 \times 2 = 16$

- (i) Explain the term target population. (ii) What is sampling. (iii) What is sampling error. (iv) Explain the term Non-probability sampling. (v) What is parameter and statistic. (vi) Name four probability sampling techniques. (vii) Explain the term regressor. (viii) Find the Y-intercept and slope of the line $\hat{Y} = 5 - 2X$. (ix) Define the term coefficient of correlation. (x) Differentiate between regression and correlation. (xi) Let $S_{xy} = 30$, $S_x = 2.5$, $S_y = 20$ find r_{xy} . (xii) When correlation between X and Y will be positive and negative.

4. Write short answer of any six parts.

 $6 \times 2 = 12$

- (i) Define co-efficient of association. (ii) Discuss Positive and Negative levels of Attributes. (iii) For a Given data if $(AB) = 110$, $(\alpha B) = 90$, $(A\beta) = 290$, $(\alpha\beta) = 510$ Discuss Association. (iv) Define Contingency table. (v) Define rank correlation co-efficient. (vi) What are the phases of a business cycle? (vii) Give two examples of seasonal variations. (viii) What is forecasting? (ix) Define signal and Noise?

SECTION ----- II

Note: Attempt any three questions. Each question carries equal marks. $(8 \times 3 = 24)$

5. (a) For a certain normal distribution the first moments about 10 is 40 and Fourth moments about 50 is 48. Find its mean and S.D.

- (b) In a normal distribution, 31% items are under 45 and 81% are over 64. Find mean and S.D.

6. (a) Draw all possible samples of size 2 without replacement from a population consisting of 3, 6, 9, 16, from the sampling distribution of mean and verify results.

(i) $\mu_{\bar{x}} = \mu$ (ii) $\sigma_{\bar{x}}^2 = \frac{\sigma^2}{n} \frac{N-n}{N-1}$

- (b) Given that $n_1 = 2$, $\mu_1 = 6$, $\sigma_1^2 = 2.67$, $n_2 = 2$, $\mu_2 = 6$, $\sigma_2^2 = 0.67$ calculate

(i) $\mu_{\bar{x}_1 - \bar{x}_2}$ (ii) $\sigma_{\bar{x}_1 - \bar{x}_2}^2$ If sampling is done with replacement.

7. (a) A random sample of size $n = 400$ selected from a population of $N = 10,000$ with $\sigma^2 = 100$. The sample mean is found to be $\bar{X} = 80$. Construct a 95% confidence interval for μ .

- (b) Test the null hypothesis $H_0: \mu = 100$ against alternative hypothesis $H_1: \mu < 100$ at $\alpha = 5\%$ using the data given in Part (a).

8. (a) Compute the regression co-efficients $n = 15$, $S_x = 7.933$, $S_y = 16.627$, $\sum(X - \bar{X})(Y - \bar{Y}) = 148$

- (b) For a given set of data, we have $r = 0.60$, $S_x = 1.50$, $S_y = 2.0$, $\bar{X} = 10$, $\bar{Y} = 20$ Find the equations of the two regression lines of Y on X and X on Y.

9. (a) From the following table, test the hypothesis that the flower colour is independent of flatness of leaf. Use $\alpha = 0.05$

	Flat Leaves	Lean Leaves
White Flowers	19	16
Red Flowers	20	15

- (b) Fit a linear trend to the following information for the years 1986 to 1992 (Both inclusive)
 $\sum X = 0$, $\sum Y = 245$, $\sum X^2 = 28$, $\sum XY = 66$ Also compute trend values.

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