

Statistics (Objective Type)

Time: 20 Minutes

RWP-22

Marks: 17

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with marker or pen ink on the answer sheet provided.

- 1.1. If $Y = 2 + 0.6X$, then value of \hat{Y} for $X = 0$ is :
 (A) 2 (B) 0.6 (C) 0.8 (D) 2.6
2. If $b_{xy} = -0.52$ and $b_{yx} = -1.02$ then r_{xy} is :
 (A) 1 (B) 0.73 (C) 0.80 (D) -0.73
3. Dependent variable is also called :
 (A) Regressand (B) Regressor (C) Explanatory variable (D) Predictor
4. For 3×4 contingency table, the degree of freedom will be :
 (A) 12 (B) 6 (C) 3 (D) 9
5. A characteristic which varies in quality is called :
 (A) Quantitative variable (B) Qualitative variable (C) Attribute (D) Both A & B
6. A business cycle has phases :
 (A) 2 (B) 3 (C) 5 (D) 4
7. The graph of time series is called :
 (A) Histogram (B) Historiogram (C) Pie-chart (D) Ogive
8. CPU stands for :
 (A) Central plain unit (B) Central programming unit
 (C) Central processing unit (D) None of these
9. In a normal distribution, X lies between :
 (A) $-\infty$ and 0 (B) $-\infty$ and ∞ (C) 0 and ∞ (D) 0 and 2
10. In normal distribution the value of β_1 and β_2 are :
 (A) 0 and 3 (B) 3 and 0 (C) 0 and 1 (D) 1 and 0
11. In normal distribution the value of Quartile Deviation is :
 (A) $\frac{2}{3}\sigma$ (B) 0.6745σ (C) Both A & B (D) 0.7979σ
12. If sampling is done with replacement, number of possible sample is :
 (A) ${}^N C_n$ (B) $N \times n$ (C) $N + N$ (D) N^n
13. Probability distribution of a sample statistic is called :
 (A) Time (B) Frequency distribution
 (C) Sampling distribution (D) None of these
14. Procedure of selecting a sample from population is called :
 (A) Sample (B) Sampling design (C) Sampling (D) None of these
15. 90% confidence interval for the mean is 53.22 and 64.78, then sample Mean is :
 (A) 59 (B) 49 (C) 69 (D) 118
16. If $n = 8$, $\sum X = 120$, $\sum (X - \bar{X})^2 = 302$. Then unbiased estimated value of the population mean is :
 (A) 15 (B) 120 (C) 8 (D) 302
17. Power of test is denoted by :
 (A) $1 - \alpha$ (B) β (C) α (D) $1 - \beta$

Roll No. _____ to be filled in by the candidate

(For All Sessions)

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Statistics (Essay Type)

Time: 2:40 Hours

Section - I

RWP-22

Marks:68

2- Write short answers of any eight parts from the following.

2 x 8 = 16

- i. Quartile deviation of a normal distribution is 3.3725. Find the approximate value of S.D and M.D.
- ii. In a normal distribution $\mu = 9$ and $Q_3 = 171$. Find S.D (σ)
- iii. In a normal distribution $\mu_4 = 243$. Find μ_2 and μ_3
- iv. What is the role of standard deviation σ in the normal curve.
- v. What is standard normal variable?
- vi. Write any two properties of best estimator.
- vii. What is interval estimation?
- viii. If $t = 2.3$, $n = 10$, $\mu = 5$, $S = 3$, find \bar{X}
- ix. Define type II error with example.
- x. Define one tailed and two tailed tests.
- xi. What is a compiler?
- xii. Differentiate between hard and soft copy.

2 x 8 = 16

3- Write short answers of any eight parts from the following.

- i. Distinguish between population and sample.
- ii. Explain the term sampling frame.
- iii. Given $n = 25$ and $\sigma_{\bar{x}} = 5$ find the value of σ^2 .
- iv. Given $\mu = 6$, $n = 2$ and $\sigma^2 = 10.8$ find $E(S^2)$.
- v. Define the standard error.
- vi. Draw all possible samples of size 3 without replacement from the population 0, 1, 2, 3, 4.
- vii. Define dependent variable in regression model.
- viii. If $a = 130$ and $b = 3.9$ write regression equation of Y on X.
- ix. What is meant by Y-intercept "a"?
- x. Given $Y = 6, 8, 10$ and $X = 0, 1, 2$. Find "b".
- xi. Explain the meaning of regression coefficient.
- xii. The regression equation of X on Y is $\hat{X} = 5y - 7$ and regression equation of Y on X is $\hat{Y} = 0.1X + 1.7$. Find correlation coefficient.

2 x 6 = 12

4- Write short answers of any six parts from the following.

- i. Define attributes.
- ii. Define positive association.
- iii. Given $(A) = 200$, $(B) = 800$, $N = 1000$. Find (AB) assuming A and B are independent.
- iv. Define the term dichotomy.
- v. Name the four methods used to measure the secular trend.
- vi. Given $Y = 16, 18, 20, 22, 24$ and $X = -2, -1, 0, 1, 2$, and $\hat{Y} = 20 + 2x$, find $\sum \hat{Y}$.
- vii. Give two examples of irregular variation.
- viii. What is semi-averages method?
- ix. What is meant by residual?

Section - II

8 x 3 = 24

NOTE : Answer any three questions from the following.

- 5.(a) In a normal distribution $Q_1 = 20$ and $Q_3 = 30$ find its Mean and Mean deviation. (b) Let $X \sim N(30, 25)$. Find (i) $P(X > 35)$ (ii) $P(X < 22)$ 04+04
- 6.(a) Take all possible samples of size 2 with replacement from the population 2, 3, 4, 5. (b) Find unbiased estimates of μ and σ from the sample of values 13, 18, 26, 34, 45 and 48. 04+04
- (i) Calculate means of the samples.
(ii) Construct sampling distribution of means.
(iii) Prove that $\mu_{\bar{x}} = \mu$.
- 7.(a) A normal population has a variance of 100. A random sample of size 16 selected from the population has a mean of 52.5. Construct the 90% confidence interval estimate of population mean, μ . Interpret the result. (b) The sex distribution of 98 births reported in a newspaper was 52 boys and 46 girls. Is this consistent with an equal sex division in the population? Use 5% level of significance. 04+04
- 8.(a) For 9 observations on supply (X) and price (Y) the following data was obtained
 $\sum(x-90) = -25$, $\sum(x-90)^2 = 301$, $\sum(y-127) = 12$, $\sum(y-127)^2 = 1006$, $\sum(x-90)(y-127) = -469$
Obtain the estimated line of regression of X on Y and estimate the supply when the price is Rs. 125. 04+04
- (b) Compute the correlation co-efficient between the variables X and Y represented in the following table.
- | | | | | | | |
|---|----|----|----|---|---|----|
| x | 2 | 4 | 5 | 6 | 8 | 11 |
| y | 18 | 12 | 10 | 8 | 7 | 5 |
- 9.(a) Given the following data
 $(AB) = 110$, $(\alpha B) = 90$,
 $(\alpha\beta) = 290$, $(\alpha\beta) = 510$. Discuss association (b) Obtain the semi-averages trend line and find the trend values from the following data. 04+04
- | | |
|-------|-----|
| Years | Y |
| 1973 | 201 |
| 1974 | 238 |
| 1975 | 392 |
| 1976 | 507 |
| 1977 | 484 |
| 1978 | 649 |
| 1979 | 742 |