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 marks in that question.

QUESTION NO. 1 DGK-12-24

1. A value calculated from population is called
   (A) Statistic   (B) Mean   (C) Proportion   (D) Parameter

2. The difference between a statistic and parameter is called
   (A) Sampling error   (B) Standard error   (C) Systematic error   (D) Non-sampling error

3. The statistical inference can be divided into ----------------- approaches.
   (A) 4   (B) 3   (C) 2   (D) 5

4. The point estimate of μ is
   (A) σ (B) $\bar{X}$ (C) σ^2 (D) μ

5. A hypothesis which is to be tested for possible rejection is called
   (A) Null   (B) Composite   (C) Simple   (D) Alternative

6. Simple linear regression model contains
   (A) Four variables   (B) Three variables   (C) One variable   (D) Two variables

7. For the least squares regression line : $\hat{y} = a + bx$, the slope is
   (A) x   (B) Zero   (C) b   (D) a

8. Co-efficient of correlation lies between
   (A) 0 and +1   (B) -1 and +1   (C) -1 and 0   (D) -2 and +2

9. Eye colour of 100 men is
   (A) Variable   (B) Constant   (C) Numerical value   (D) Attribute

10. If $(AB) > \dfrac{(A)(B)}{n}$, then association is
    (A) Negative   (B) Perfect   (C) Positive   (D) No association

11. Decomposition of time series is called
    (A) Analysis of time series   (B) Histogram   (C) Historigram   (D) Detrending

12. A rise in prices before eid is an example of
    (A) Secular trend   (B) Seasonal variations
    (C) Cyclical variations   (D) Irregular variations

13. A set of instructions that runs the computer is called
    (A) Printers   (B) Hardware   (C) Monitors   (D) Software

14. In a normal distribution , $N(\mu, \sigma^2)$ mean deviation is equal to
    (A) $0.5\,\sigma$ (B) $0.6745\,\sigma$ (C) $0.7979\,\sigma$ (D) $1.5\,\sigma$

15. Normal distribution is
    (A) Uni-modal   (B) Bi-modal   (C) Tri-modal   (D) Multimodal

16. For the standard normal variable , $P(0 \leq Z \leq 1) =$ --------------
    (A) 0.3413   (B) 0.4772   (C) 0.4986   (D) 0.3372

17. A sample is a subpart of the
    (A) Sampling   (B) Population   (C) Unit   (D) Error

QUESTION NO. 2   Write short answers any Eight (8) parts of the following

(i)	In Normal Distribution; $Q_1 = 8$ and $Q_3 = 17$ Find S.D	(ii)	Write equation of normal distribution if mean is 10 and variance is 9
(iii)	Write at least 2 properties of normal distribution.	(iv)	What is point of inflection in normal curve ?
(v)	Write a short note on importance of normal distribution.	(vi)	Confidence Interval for mean is given as : $12.18 < \mu < 20.56$ Find $\bar{x}$
(vii)	Explain the concept of confidence Interval.	(viii)	What is test statistic ?
(ix)	Write a short note on testing of hypothesis.	(x)	If $\mu = 5$, $t = 3$, $\bar{x} = 14$, $n = 9$ then find $\hat{S}$
(xi)	Differentiate between ROM and RAM.	(xii)	Describe the function of modem.

QUESTION NO. 3   Write short answers any Eight (8) parts of the following   16

(i)	What is meant by " Sampling " ?	(ii)	Define finite population. Also give an example.
(iii)	Given $\sigma = 6$, and $n = 30$ find $\sigma_{\bar{x}}$.	(iv)	If $n = 25$ and $\sigma_{\bar{x}} = 5$, Find σ^2
(v)	Given $b_{xy} = 0.82$, $r_{xy} = 0.97$, Find b_{yx}	(vi)	Define Sampling with replacement.
(vii)	Given $r_{xy} = 0.8$, $S_x = 4$, $S_{xy} = 20$, Find standard deviation of y i.e s_y.	(viii)	Given $y = 6, 8, 10$ and $x = 0, 1, 2$. Find regression coefficient of y on x
(ix)	Given $p_1 = {}^2/_3$, $n_1 = 200$, $p_2 = {}^1/_2$, $n_2 = 200$, Find $\mu_{\hat{p}_1 - \hat{p}_2}$	(x)	Given : $\bar{y} = 1.87$, $b = 0.25$, $\bar{x} = 12.45$ Find value of y-intercept ie "a"
(xi)	Define positive correlation. Also give an example.	(xii)	Given $\hat{y} = 45 - 10x$, Find $\hat{y}$ when $x = 3, 4$

QUESTION NO. 4   Write short answers any Six (6) parts of the following   12

(i)	Explain contrary class.	(ii)	Define contingency table.
(iii)	Given $\sum d^2 = 440$ and $n = 11$. Find Spearman's coefficient of rank correlation.	(iv)	Name the methods used to estimate secular trend.
(v)	Explain analysis of time series.	(vi)	Define Irregular movements with example.
(vii)	Write two examples of seasonal variations.	(viii)	Given $\hat{y} = 13 + 8x$ and $x = -2, -1, 0, 1, 2$ Find trend values.
(ix)	If $Y_2' = 160$, $Y_1' = 100$, $x_2 = 6$, $x_1 = 2$ Find Semi-Average trend line. $Y' = a + bx$		

SECTION-II

Note: Attempt any Three questions from this section $8 \times 3 = 24$

Q. 5(a)	If $X \sim N(25, 16)$, find Q_1 and Q_3
(b)	Find the two points containing the middle 95 % area of standard normal distribution.
Q. 6(a)	Draw all possible of size 2 without replacement from the letters of word " KASHM ". Find the proportion of vowel letters in each sample and show that. $\mu_p = \pi$ and $\sigma_p^2 = \dfrac{\pi(1-\pi)}{n} \times \dfrac{N-n}{N-1}$
(b)	Given $\mu_1 = 4500$, $\mu_2 = 4000$, $\sigma_1 = 200$, $\sigma_2 = 250$, $N_1 = 400$, $N_2 = 300$, $n_1 = 100$ and $n_2 = 50$ Determine the expected mean and standard deviation of the sampling distribution of difference of the means if sampling is done (i) with replacement (ii) without replacement
Q. 7(a)	A random sample of 25 values gives the average of 83. Can this sample be regarded as drawn from the normal population with mean 80 and S.D 7 ?
(b)	Given that : $n_1 = 150$, $\bar{X}_1 = 1400$, $\sigma_1^2 = 120$, $n_2 = 200$, $\bar{X}_2 = 1200$, $\sigma_2^2 = 80$ Calculate 95% confidence interval for $\mu_1 - \mu_2$
Q. 8(a)	Obtain regression line y on x from the following data

X	3	5	9	12
Y	15	20	26	35

(b)	Find co-efficient of correlation from following information $\sum xy = 3467$, $\bar{x} = 13$, $\bar{y} = 22$, $s_x = 7.73$, $s_y = 8.04$, $n = 10$
Q. 9(a)	Compute the value of Chi-Square from the following data

	Parents			
Off spring	Very Tall	Tall	Medium	Short
Very Tall	20	30	20	2
Tall	14	125	85	12
Medium	3	140	165	125
Short	3	37	68	151

(b)	Fit a straight line $y = a + bx$, from the following results $n = 11$, $\sum x = 0$, $\sum x^2 = 110$, $\sum x^4 = 1958$, $\sum y = 438.9$, $\sum xy = -84.4$

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