DGK-12-18

**PAPER CODE - 8181**

(12th CLASS – 12018)

**STATISTICS (NEW COURSE)**
ACADEMIC SESSION : 2015 - 2017 TO 2016 - 2018

TIME: 20 MINUTES
MARKS: 17

**OBJECTIVE**

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.

## QUESTION NO. 1

| | |
|---|---|
| 1 | In a Normal distribution x lies between<br>(A) - ∞ and 0 (B) - ∞ and + ∞ (C) 0 and + ∞ (D) - 1 and + 1 |
| 2 | Normal distribution has parameters<br>(A) $\mu$ (B) $\mu , \sigma^2$ (C) $\sigma$ (D) x , $\mu$ , p |
| 3 | The value of $\pi$ is equal to<br>(A) 1.1415 (B) 2.1415 (C) 4.1415 (D) 3.1416 |
| 4 | Which one of the following is not probability sampling<br>(A) Simple random sampling (B) Systematic sampling (C) Stratified sampling<br>(D) Judgment sampling |
| 5 | A complete list of elements in a population is called<br>(A) Population (B) Sampling design (C) Sampling frame (D) Sampling unit |
| 6 | In sampling with replacement the no of possible samples are<br>(A) $N^n$ (B) $N_{en}$ (C) $N_{pn}$ (D)$N_{pr}$ |
| 7 | In interval estimation we always get<br>(A) A single value (B) Two values (C) Range of values (D) Three values |
| 8 | Usually a null hypothesis is denoted by<br>(A) $H_o$ (B) $H_1$ (C) $H_b$ (D) $H_a$ |
| 9 | If R.R(region of rejection) is $Z < Z_\alpha$ then the test is<br>(A) Right tailed (B) Left tailed (C) Two tailed (D) None of these |
| 10 | In regression $\hat{Y} = a + bx$ independent variable is denoted by<br>(A) Y (B) X (C) a (D) b |
| 11 | Independent variable is also called<br>(A) Regressor (B) Regressand (C) Predictand (D) Explained |
| 12 | If both the variables move in the same direction then r is<br>(A) Zero (B) Negative (C) Positive (D) One |
| 13 | The Chi-square curve always ranges from<br>(A) - ∞ to + ∞ (B) 0 to ∞ (C) - ∞ to 0 (D) 0 to 1 |
| 14 | (A) + ($\alpha$ ) is equal to<br>(A) n (B) $\alpha$ (C) B (D) A |
| 15 | A time series has …….. components<br>(A) Two (B) Three (C) Four (D) Five |
| 16 | The graph of time series is called<br>(A) Histogram (B) Straight line (C) Historigram (D) Ogive |
| 17 | The " CPU " of the computer is<br>(A) Output device (B) Software (C) Hardware (D) Input device |

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**STATISTICS (NEW COURSE)** — **12th CLASS - 12018** — **TIME: 2.40 HOURS**

ACADEMIC SESSION : 2015 - 2017 TO 2016 – 2018 — **(SUBJECTIVE)** — **MARKS: 68**

## SECTION-I

**QUESTION NO. 2 Write short answers any Eight (8) questions of the following** **16**

(1) Define a normal distribution
(2) Enlist any four properties of a normal distribution
(3) In a normal distribution the value of S.D.= 4. Find the values of second and fourth moments about Mean
(4) In normal distribution $Q_1 = 65$ and $Q_3 = 75$ . Find the value of Mean and Median
(5) In normal distribution $\mu = 80$ , $\sigma^2 = 36$. Find quartiles
(6) Differentiate between Estimator and Estimate.
(7) What do you understand by confidence interval ?
(8) What is meant by testing of hypothesis?
(9) Define the terms null and alternative hypothesis
(10) Define the term test statistic
(11) Write down the main categories of computers
(12) Differentiate between hardware and software

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

(1) What is sampling design ?
(2) What is sampling with replacement ?
(3) Define parameter
(4) Define probability sampling
(5) If $\mu = 7$ , $\sigma^2 = 3.15$ , $n = 6$ , $N = 10$ , find $S.E(\bar{x})$ if sampling is without replacement
(6) What do you understand by " Standard error " ?
(7) What is meant by scatter diagram ?
(8) What is least square principle ?
(9) Write two properties of the least square regression line
(10) Define negative correlation
(11) Describe any two properties of correlation co-efficient " r "
(12) If $b_{yx} = 0.11$ and $b_{xy} = 0.22$ find value of correlation co-efficient " r "

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

(1) What is meant by positive association ?
(2) Define Chi-square distribution
(3) When two attributes are said to be associated ?
(4) Interpret the meaning of co-efficient of association Q when Q = 0 , Q = + 1
(5) Given (B) = 50 and (AB) = 30. Find ($\propto$ B).
(6) Define seasonal variations
(7) What are long term variation ?
(8) Explain moving average method
(9) Write down multiplicative time series model

## SECTION-II

**Note: Attempt any Three questions from this section** **8 x 3 = 24**

5.(a) The 90th percentile of a normal distribution is 50 while the 15th percentile is 25. Find $\mu$ and $\sigma$

(b) If $X \sim N(\mu, 144)$ and $P(X > 92) = 4.78\%$ Find the value of the mean $\mu$

6.(a) A population consists of two values 0 and 3 . Take all possible samples of size n = 3 with replacement. Show that $\sigma_{\bar{x}}^2 = \sigma^2/3$

(b) A small society has N = 4500 members. The president take n = 400 questionnaires to a random sample without replacement. If P = 0.7 then find mean and variance of sampling distribution of sample proportion ( $\hat{P}$ ) . Here P = population proportion and $\hat{P}$ = sample proportion

7.(a) A sample poll of 100 voters chosen at random from all voters in a given district indicated that 55 % of them were in favour of a particular candidate. Find 95 % confidence limits for the proportion of all the voters in favour of this candidate

(b) A random sample of size 36 is taken from a normal population with known variance $\sigma^2 = 25$ , If the mean of the sample is $\bar{x} = 42.6$. Test the null hypothesis $\mu \geq 45$ using $\propto = 0.05$

8.(a) Fit a least square line $\hat{Y} = a + bx$ for the following data

| X | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Y | 2 | 5 | 6 | 8 | 9 |

(b) Find correlation Co-efficient for the data given below

| X | 4 | 2 | 7 | 1 | 5 |
|---|---|---|---|---|---|
| Y | 5 | 6 | 2 | 7 | 4 |

9.(a) An investigation into colour-blindness and sex of a person gave the following results

| | Colourblindness | |
|---|---|---|
| Sex | Colourblind | Not colourblind |
| Male | 36 | 964 |
| Female | 19 | 981 |

Is there evidence, at the 5 % level , of an association between sex of a person and whether or not they are colourblind ?

(b) Fit a straight line $\hat{y} = a + bx$ from the following results , for the years 1985 – 95 (both inclusive) Find out the trend values of y as well $\Sigma x = 0$ , $\Sigma y = 438.9$ , $\Sigma x^2 = 110$ and $\Sigma xy = -84.4$



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