



Roll No.

Answer Sheet No. _____

Sig. of Candidate. _____

Sig. of Invigilator. _____

STATISTICS HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

NOTE:- Section-A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

- (i) The probability of an event cannot be _____.
 A. =0 B. <1 C. >1 D. =1
- (ii) An orderly arrangement of objects is called _____.
 A. Combination B. Permutation C. Factorial D. Space set
- (iii) When three coins are tossed simultaneously P(3 heads) is equal to _____.
 A. $\frac{3}{8}$ B. $\frac{1}{2}$ C. $\frac{1}{4}$ D. $\frac{1}{8}$
- (iv) Random numbers can be generated _____.
 A. Manually B. Mechanically C. Both A and B D. None of these
- (v) $E[X - E(X)]^2$ is _____.
 A. $E(X)$ B. $E(X^2)$ C. $S.D(X)$ D. $Var(X)$
- (vi) $Var(4X+8)$ is _____.
 A. $12 Var(X)$ B. $16 Var(X)$ C. $4 Var(X)+8$ D. $16 Var(X)+8$
- (vii) The hypergeometric distribution has _____.
 A. Two parameters B. Three Parameters
 C. One parameter D. None of these
- (viii) If $n = 6$ and $p = 0.9$, then the value of $P(x=7)$ is _____.
 A. Zero B. More than Zero C. One D. None of these
- (ix) The mean and variance of standard normal variate are _____.
 A. 0 and 1 B. μ and σ C. μ and σ^2 D. None of these
- (x) Almost all area of a normal curve lies under the range _____.
 A. $\mu \pm \sigma$ B. $\mu \pm 2\sigma$ C. $\mu \pm 3\sigma$ D. None of these
- (xi) Sampling frame is a list of elements of the _____.
 A. Sample B. Population C. Subset D. Sample space
- (xii) A value calculated from the sample is called a _____.
 A. Mean B. Proportion C. Parameter D. Statistic
- (xiii) If $E(\hat{\theta}) = \theta$, then $\hat{\theta}$ is _____.
 A. Biased B. Unbiased
 C. Positively biased D. Negatively biased
- (xiv) When $s^2 = \frac{\sum(x - \bar{x})^2}{n-1}$ then, $E(s^2) =$ _____.
 A. σ^2 B. $\frac{\sigma^2}{n}$ C. $\frac{\sigma^2}{n-1}$ D. $\left(\frac{n-1}{n}\right)\sigma^2$
- (xv) A characteristic which varies in quality from one individual to another is called _____.
 A. Parameter B. Statistic C. Attribute D. Regression
- (xvi) The value of chi-square can not be _____.
 A. Negative B. Zero C. Positive D. Fractional
- (xvii) The most common output devices are _____.
 A. Software B. Monitor and Printer
 C. Keyboard and Mouse D. None of these

For Examiner's use only:

Total Marks:

17

Marks Obtained:



STATISTICS HSSC-II

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Time allowed: 2:35 Hours

Total Marks Sections B and C

NOTE:- Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separate provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. All parts carry equal marks. (14 x 3 = 42)

- (i) Differentiate between Simple and Compound events.
- (ii) Define equally likely and exhaustive outcomes.
- (iii) Given $P(A) = \frac{5}{9}$, $P(B) = \frac{4}{9}$, $P(B/A) = \frac{2}{5}$ Find $P(A/B)$.
- (iv) Given $x = 0, 1, 2$ and $p(x) = \frac{9}{16}, \frac{6}{16}, \frac{1}{16}$. Find $\text{Var}(X)$.
- (v) Distinguish between Discrete and Continuous random variables.
- (vi) In 900 trials of a throw of two dice, what is expected number of times that sum will be less than 5?
- (vii) A random variable X is believed to follow a binomial distribution $b(x; 5, p)$. If $P(X = 0) = \frac{243}{1024}$, then find $P(X = 3)$.
- (viii) Given $N = 10$, $n = 4$, $K = 3$. Find Mean and Variance of hypergeometric distribution.
- (ix) In a normal distribution, the lower and upper quartiles are respectively 8 and 17. Find mean and S.D.
- (x) In a normal distribution, mean is zero and the standard deviation is 1. Write down its equation and find the value of the maximum ordinate.
- (xi) What are Sampling and Non-sampling errors?
- (xii) Find μ and σ^2 if samples of size 2 with replacement give mean and variance as 10 and 2.5, respectively.
- (xiii) Given $p_1 = \frac{2}{3}$, $n_1 = 2$, $p_2 = \frac{1}{2}$, $n_2 = 2$. Find mean and variance of sampling distribution of differences between two proportions.
- (xiv) Differentiate between Point and Interval estimation.
- (xv) What is the difference between Simple and Composite hypothesis?
- (xvi) If $H_0: \mu_1 - \mu_2 = 0$ vs $H_1: \mu_1 - \mu_2 \neq 0$, $n_1 = 11$, $n_2 = 14$, $\bar{X}_1 = 75$, $\bar{X}_2 = 60$, $(n_1 - 1)s_1^2 = 372.1$, $(n_2 - 1)s_2^2 = 365.34$. Then find the value of 't'.
- (xvii) Differentiate between Positive and Negative association.
- (xviii) What do you mean if $Q = 0$, $Q = 1$, $Q = -1$?
- (xix) Differentiate between Hardware and Software.

SECTION – C (Marks 26)

Note:- Attempt any TWO questions. All questions carry equal marks. (2 x 13 = 26)

- Q. 3 a. Two cards are drawn at random from a well-shuffled pack of 52 cards. Find the probability that: 06
 - (i) One is king and the other a queen
 - (ii) Both are of the same colour
 - (iii) Both are of different colours
- b. A committee of size 5 is to be selected at random from 3 women and 5 men. Find the expected number of women on the committee. Also calculate variance. 07
- Q. 4 a. In a normal distribution mean is 20 and S.D 16. Find: 06
 - (i) The area below 23
 - (ii) The area between 23 and 30
 - (iii) Two points containing middle 95% of the area
- b. Draw all possible random samples of size 2 with replacement from the population 1, 2, 3, 4, 5. Show that mean of sample means is equal to the population mean and variance of sample means is half of the population variance. 07
- Q. 5 a. The hourly wages of 144 workers of a large factory were recorded, the sample mean and standard deviation were found to be Rs: 23.52 and Rs: 6.71, respectively. Find a 99% confidence interval for the mean wages of factory workers. 05
- b. Find Chi-square to test the hypothesis that there is no association between height of fathers and height of sons: 08

	Fathers	Very Tall	Tall	Short
Sons				
Very Tall		63	49	9
Tall		60	79	28
Short		29	60	23