

Roll No. 

--	--	--	--	--	--

Answer Sheet No. 44

Sig. of Candidate. \_\_\_\_\_

Sig. of Invigilator. \_\_\_\_\_

## STATISTICS HSSC-II

### SECTION - A (Marks 17)

**Time allowed: 25 Minutes**

**NOTE:** Section-A is compulsory and comprises pages 1-2. 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) Probability is a measure of:  
A. Uncertainty    B. Certainty    C. Quality    D. None of these
- (ii) The number of outcomes in a random experiment are:  
A. More than one    B. More than two    C. More than three    D. None of these
- (iii) If 'X' and 'Y' are independent random variables, then  $E(XY) = ?$   
A.  $XY$     B.  $E(X) + E(Y)$     C.  $E(X)E(Y)$     D.  $E(X) - E(Y)$
- (iv) The distribution function  $F(x)$  is equal to:  
A.  $P(X = x)$     B.  $P(X \leq x)$     C.  $P(X \geq x)$     D. None of these
- (v) A discrete probability distribution may be represented by:  
A. Table    B. Graph  
C. Mathematical equation    D. All of these
- (vi)  $\int_{-\infty}^{\infty} f(x)dx$  is always equal to:  
A. Zero    B. One    C.  $E(X)$     D.  $f(x) + 1$
- (vii) The parameters of a binomial distribution are:  
A. p and q    B. np and nq    C. n and p    D. n and q
- (viii) In hyper geometric distribution the successive trials are:  
A. Very large    B. Very small    C. Independent    D. Dependent
- (ix) Area under standard normal curve is:  
A. 1    B. 0    C. 10    D. 100
- (x) If  $\sigma = 5$  and  $n = 25$ , then  $\sigma_{\bar{x}} = ?$   
A. 5    B. 1    C.  $\frac{1}{\sqrt{5}}$     D.  $\frac{1}{5}$
- (xi) A complete list of all the sampling units is called:  
A. Sample design    B. Sampled population  
C. Target population    D. Sampling frame
- (xii) The complement of null hypothesis is called:  
A. Simple hypothesis    B. composite hypothesis  
C. Alternate hypothesis    D. Statistical hypothesis
- (xiii) When level of significance is 0.01, then level of confidence is:  
A. 0.90    B. 0.95    C. 0.99    D. 0.995
- (xiv) For two independent attributes  $Q = ?$   
A. 0    B. +1    C. -1    D.  $> 0$
- (xv) The degrees of freedom in test of independence is:  
A.  $(C - 1)$     B.  $(r - 1)(C - 1)$     C.  $(r - 1)$     D. None of these
- (xvi) Microcomputers are also known as:  
A. Mainframe computers    B. Super computers  
C. Mini computers    D. Personal computers
- (xvii) Mouse is an example of:  
A. Input unit    B. Output unit  
C. Secondary storage    D. Central processing unit

**For Examiner's use only:**

Total Marks:

17

Marks Obtained:



# STATISTICS HSSC-II

45

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

**NOTE:** Sections 'B' and 'C' comprise pages 1-2 and questions therein are to be answered on the separately provided answer book. Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly. Statistical table will be provided on demand.

## SECTION - B (Marks 42)

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

- (i) How many possible permutations can be formed from the word "Statistics"?
- (ii) Define random experiment.
- (iii) Two cards are drawn from a well shuffled pack of 52 cards. What is the probability that both cards are of same colour?
- (iv) Differentiate between discrete and continuous random variables.
- (v) Given  $f(x) = \frac{x}{10}$ ,  $x = 1, 2, 3, 4$ . Show that  $f(x)$  is a probability function.
- (vi) A continuous random variable 'X' has a density function:  $f(x) = \frac{1}{3}$  for  $1 \leq x \leq 4$ . Find  $P(1.5 < x < 3)$
- (vii) Write down the equation of Hyper geometric distribution. Also write its mean and variance.
- (viii) If you throw a fair die 5 times, what is the probability that you will get no even number?
- (ix) State the properties of binomial experiment.
- (x) Define central processing unit.
- (xi) A computer shop contains 3 good and 2 defective monitors. Two monitors are selected without replacement from them. Find the probability that one is good and other a defective.
- (xii) The mean deviation of a normal distribution is 16. Find the approximate value of its S.D.
- (xiii) For a normal distribution with  $\mu = 0$  and  $\sigma^2 = 1$ , what are upper and lower quartiles?
- (xiv) Differentiate between sampling with replacement and sampling without replacement.
- (xv) Given  $n_1 = 2$ ,  $n_2 = 2$ ,  $\mu_1 = 6$ ,  $\mu_2 = 2$ ,  $\sigma_1^2 = 2.67$ ,  $\sigma_2^2 = 0.67$ . Find  $\mu_{\bar{x}-\bar{y}}$  and  $\sigma_{\bar{x}-\bar{y}}^2$
- (xvi) What is difference between point and interval estimation?
- (xvii) Given  $\bar{d} = 3$ ,  $n = 9$ ,  $s_d = 3$ . Find 95% confidence interval for  $\mu_d = \mu_1 - \mu_2$
- (xviii) Differentiate between positive and negative association.
- (xix) Differentiate between 'RAM' and 'ROM'.

**SECTION – C (Marks 26)**

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

**Q. 3 a.** Three missiles are fired at a target. If the probabilities of hitting the target are 0.4, 0.5 and 0.6 respectively and if the missiles are fired independently, what is the probability that at least two missiles hit the target? (05)

**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 find its standard deviation. (08)

**Q. 4 a.** In a Normal distribution  $\mu = 47.6$  and  $\sigma = 16.2$ . Find (06)

(i) The probability that a single observation will be larger than 60

(ii)  $P_{10}$  and  $P_{80}$

**b.** A finite population consists of 4 smokers denoted by  $S_1, S_2, S_3, S_4$  and 2 non-smokers  $N_1$  and  $N_2$ . Draw all possible random samples of size 2 without replacement from the population and calculate proportion of smokers ' $\hat{P}$ ' in each sample. write down the sampling distribution of ' $\hat{P}$ ' and find the following: (i)  $\mu_{\hat{P}}$  (ii)  $\sigma_{\hat{P}}^2$  (07)

**Q. 5 a.** A sample of 400 has mean 6.0 inches. Can this be regarded as a simple random sample from a large population with mean 6.2 inches and S.D of 2.25 inches? (05)

**b.** Find the value of chi-square for the following table: (08)

	A1	A2	A3
B1	215	325	60
B2	135	175	90

Are 'A' and 'B' independent at 1% level of significance?

— 2HA 1614 —