

# MODEL PAPER "STATISTICS"

## Intermediate Part-I Examination

### OBJECTIVE

Time: 20 Minutes

Marks: 17

**Note:** Write answers to the questions on the objective answer sheet provided. You have four choices for each objective type question as A, B, C, and D. The choice which you think is correct; fill the circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling to or more circles will result in zero mark in that question. Attempt as many question as given in objective-type question paper and leave others blank.

- (i) If 'a' is a constant, then  $\sum_{i=1}^5 a$  equals:  
(a)  $a_1+a_2+a_3+a_4+a_5$  (b)  $a_5$  (c)  $5a$  (d)  $a+5$
- (ii) Statistics are:  
(a) Aggregate of facts and figures (b) Always true  
(c) Always continuous (d) Always qualitative
- (iii) A graph of a cumulative frequency distribution is called:  
(a) Frequency curve (b) Frequency polygon (c) Ogive (d) Histogram.
- (iv) Census returns are :  
(a) Primary data (b) Secondary data  
(c) Qualitative data (d) True data.
- (v) The harmonic mean of two numbers 'a and b' is :  
(a)  $\frac{2}{a+b}$  (b)  $\frac{ab}{a+b}$  (c)  $\frac{2ab}{a+b}$  (d)  $\frac{a+b}{ab}$
- (vi) The sum of deviations taken from A.M. is:  
(a) 1 (b)  $\sum f$  (c) n (d) zero
- (vii) If left tail is longer than the right tail, then distribution is called:  
(a) Negatively skewed (b) Positively skewed  
(c) Symmetrical (d) None
- (viii) The first moment about mean is equal to:  
(a) Variance (b) Zero (c) Mean (d) Standard deviation
- (ix) If all items are given equal weights, the index Number is called:  
(a) Weighted (b) Un-weighted (c) Simple (d) None
- (x) An index number is called composite index when it is computed from:  
(a) Simple variable (b) Bi-variable  
(c) Multiple variable (d) None of them
- (xi) The number of permutations of 'r' objects taken out of total 'n' objects is:  
(a)  ${}^n C_r$  (b)  ${}^n P_r$  (c)  ${}^n C_x$  (d)  ${}^N C_n$
- (xii) The probability of sure event is:  
(a) Zero (b) Negative (c) One (d) None
- (xiii) Two events A and B are called mutually exclusive if:  
(a)  $P(A \cup B) = \phi$  (b)  $P(AB) = \phi$  (c)  $P(A \cap B) = S$  (d)  $P(A \cap B) = 1$

- (xiv) A set of numerical values assigned to a sample space is called:  
(a) Random variable (b) Random sample  
(c) Random numbers (d) Random experiment
- (xv)  $\text{Var}(4x+8)$  is:  
(a)  $12 \text{Var}(X)$  (b)  $4 \text{Var}(X)+8$  (c)  $16 \text{Var}(X)$  (d)  $16 \text{Var}(X)+8$
- (xvi) The binomial distribution is negatively skewed if:  
(a)  $p < \frac{1}{2}$  (b)  $p = \frac{1}{2}$  (c)  $p > \frac{1}{2}$  (d)  $p=1$
- (xvii) The mean of the hyper-geometric distribution is:  
(a)  $\frac{nk}{N}$  (b)  $\frac{Nk}{n}$  (c)  $\frac{Nn}{k}$  (d)  $\frac{n+k}{N}$

**MODEL PAPER “STATISTICS”**  
**Intermediate Part-I Examination**

**SUBJECTIVE**

Time: 2:40Hours

Marks: 68

**SECTION -I**

**Note: Out of Questions Nos.1,2,3, and 4 write any 22 (Twenty two) short answers. While writing answer write question No. carefully.**

**Q.No.1. Write short answers. (22x2)=44**

- (i) Define Statistics.
- (ii) Differentiate between variable and constant.
- (iii) Distinguish between Primary and Secondary data.
- (iv) Define class limit and class boundary
- (v) Define classification.
- (vi) Define tabulation.
- (vii) Write down the important points to prepare a good table.
- (viii) In a moderately asymmetrical distribution the value of median is 53 and the value of mode is 50. Determine the mean.

**Q.No.2. Write short answers.**

- (i) The mean of n value is 8. If a new value 28 is included, the mean becomes 9. find the value of n.
- (ii) What is meant by measures of central tendency?
- (iii) Write the qualities of a good average.
- (iv) The first four moments about the A.M. of a distribution are 0,4,6 and 48. Find  $b_2$ .
- (v) Explain the moments about mean.
- (vi) Write mathematical properties of S.D.
- (vii) Distinguish between simple and composite index numbers.
- (viii) Explain the meaning of consumer price index number.

**Q.No.3. Write short answers.**

- (i) Given  $W = 20, 25, 30, 40$  and  $I = \frac{P_n}{P_o} \times 100 = 100, 105, 110, 120$ . Find consumer price index number.
- (ii) Given the following information:  $\sum p_n q_o = 4220$ ,  $\sum p_o q_o = 3520$   
 $\sum p_n q_n = 4810$  and  $\sum p_o q_n = 4020$ . Find Marshal- Edge worth index.
- (iii) Differentiate between absolute and relative dispersion.
- (iv) Define Mean deviation.
- (v) What are weighted Index numbers.
- (vi) What are properties of variance.
- (vii) Write the statement for addition law of probability for any 2 events.
- (viii) Prove addition law for mutually exclusive events.

**Q.No.4. Write short answers.**

- (i) Define a random variable.
- (ii) If  $P(A) = 0.7$ ,  $P(B) = 0.5$  and  $P(B/A) = 0.5$ , find  $P(A \cap B)$ .
- (iii) If 3 coins are tossed, what is the probability of getting at most two heads?
- (iv) Given  $E(X+4) = 10$  and  $E(X+4)^2 = 116$ , determine  $\text{Var}(X)$ .
- (v) Write properties of mathematical expectation.
- (vi) Write formulas of mean and variance of the binomial distribution.
- (vii) Write the properties of binomial experiment.
- (viii) Define Hyper geometric distribution.

- (ix) In a binomial distribution, the mean is 3 and standard deviation is 1.5, find its parameters.

### SECTION -II

Note: - Attempt any THREE questions.

(8x3)=24

Q.No.5.

- (a) Draw an ogive for the following data

Groups	10-19	20-29	30-39	40-49	50-59	60-69
No of Boys	15	20	25	30	15	10

- (b) The frequency distribution given below has been derived from the use of working origin. If  $D=X-18$ , find A.M. and H.M.

D	-12	-8	-4	0	4	8	12
F	2	5	8	18	22	13	8

Q.No.6.

- (a) A variable Y is obtained from a variable X by the equation  $Y=2X +5$ . Determine the Y values when the X value are 3,6,2,1,7,5. verify that  $V_{ax}(Y) = 4V_{ax}(X)$
- (b) The first four moments about  $X=20$  of a distribution are  $-2,38, -104$  and  $3088$ . find out whether the distribution is leptokurtic, meso kurtic or platy kurtic.

Q.No.7.

- (a) Construct the chain indices for the following data for price relatives for 1941 to 1944:

Year	Sugar	Gur	Tea
1941	98	75	82
1942	100	82	74
1943	114	83	78
1944	109	84	89

- (b) Give the following information:

$\sum p_0q_0 = 3600, \sum p_1q_0 = 4300, \sum p_0q_1 = 4100$  and  $\sum p_1q_1 = 4890$ . Show That Fishers ideal price index number is the G.M. of Laspyres and Pasche's price index numbers,

Q.No.8.

- (a) A bag contains 7 white, 5 black and 4 red balls. If two balls are drawn at random, find the probability that:
- (i) both balls are white (ii) one is black and other is red.
- (b) A function is given by  $f(x) = \frac{3+2x}{18}, 2 \leq x \leq 4$ . show that it is probability

density function and find the Probability

That (i)  $x \geq 2.5$  (ii)  $x < 3.5$

Q.No.9.

- (a) Find the mean and S.D. of the binomial  $(q+p)^3$

- (b) Five balls are drawn from a box containing 4 white and 7 black balls. If X denotes the number of black balls drawn from the box, then obtain the probability distribution of X. Find the mean and variance of this distribution.