2015 (A) Roll No: _____

INTERMEDIATE PART-I (11th CLASS)

STATISTICS PAPER-I (NEW SCHEME) TIME ALLOWED: 3.10 Hours

SUBJECTIVE MAXIMUM MARKS: 83

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. **8 × 2 = 16**

(i) Differentiate between Parameter and Statistics.

(ii) Name the sources of secondary data.

(iii) Given $\overline{X}_1 = 2.53$, $\overline{X}_2 = 1.97$, $\overline{X}_3 = 4.05$ each Mean is based on 6 observations. Find Combined Mean.

(iv) Given $u = \frac{x - 170}{5}$, $\sum fu = 100$, $\sum f = 200$ find A.M.

(v) Define the term Median and write its formula.

(vi) Differentiate between Simple Arithmetic Mean and Weighted Arithmetic Mean.

(vii) Write down the empirical relationship between Mean, Median and Mode and find Mode when Mean = 30.5 and Median = 12.3.

(viii) Given Fisher's Ideal price index number = 104.3 and Paasche's Price Index Number = 103.2 then find Laspeyre's Price Index Number.

(ix) Given P_o = 16, 15, 12, 20, 22 and P_1 = 20, 12, 15, 22, 22, then find $I = \frac{P_1}{P_0} \times 100$

(x) Differentiate between Simple and Composite Index Number.

(xi) Explain Consumer's Price Index Number and how is it calculated?

(xii) Describe the Chain Base Method.

3. Attempt any eight parts. **8 × 2 = 16**

(i) Define Histogram.

(ii) Define Relative Frequency.

(iii) If $Q_1 = 88.03$, $Q_3 = 94.50$, compute coefficient of Q.D.

(iv) A series comprises of hundred values each equal to "5". What will be the average and dispersion of the series?

(v) Describe the properties of variance (any two).

(vi) What is Kurtosis?

(vii) What is a symmetrical distribution?

(viii) Define Combined Variance.

(ix) State the Multiplication law of probability?

(x) Define Conditional Probability.

(xi) Define Mutually Exclusive Events.

(xii) State the Compliment Law of Probability.

4. Attempt any six parts. **6 × 2 = 12**

(i) Define Random Variable.

(ii) What is Discrete Probability Distribution?

(iii) Make random variable for tails when three coins are tossed.

(iv) Write down two laws of mathematical expectation.

(v) Given $E(x) = 10$ and $E(x)^2 = 500$; find coefficient of variation.

(vi) Give any two properties of Hypergeometric experiment which are different from Binomial experiment.

(vii) What is Mean and Variance of Binomial Distribution?

(vii) If $n = 8$ and $p = 0.4$, then find variance of Binomial Distribution.

(ix) If $N = 10$, $n = 3$, $k = 4$, find variance of Hypergeometric Distribution.

SECTION-II

NOTE: - Attempt any three questions.

5.(a) The arithmetic mean and harmonic mean of two observations are 5 and 3.2 respectively. Find the geometric mean. 4

(b) Compute the median from the following data:- 4

Classes	0 – 7	7 – 14	14 – 21	21 – 28	28 – 35
f	5	11	15	9	4

P.T.O

6.(a) Calculate M.D from mean from the following data:- 4

x	110	120	130	140	150	160
f	4	6	7	7	8	2

(b) First three moments about $x = 62$ are 1, 4 and 10. Find first three moments about mean. 4

7.(a) For the data given (i) $\sum p_1 q_1 = 1500,\ \sum p_0 q_0 = 780,\ \sum p_1 q_0 = 880,\ \sum p_0 q_1 = 1370$ 4

Compute (i) Base year weighted index numbers
(ii) Current year weighted index numbers
(iii) Fisher's index numbers

(b) From a well shuffled pack of 52 playing cards, a card is drawn at random.
Find the probability that card drawn is:- (i) Red card (ii) Black card
(iii) Diamond card (iv) Pictured card 4

8.(a) A random variable x has the probability distribution $f(x) = A\binom{5}{x}$ $x = 0, 1, 2, 3$ 4

(i) Determine the value of A (ii) Determine $E(X)$

(b) A continuous random variable X can assume value between $X = 1$ and $X = 3$ has a density function given by $f(x) = \frac{x}{2}$ (i) show that area under the curve is equal to one

(ii) $p(x < 2)$ 4

9.(a) A committee of size 4 is to be selected at random from 3 women and 4 men.
Find the probability that (i) 2 women (ii) At least 2 women
will be selected in the committee 4

(b) A random variable 'X' is believed to follow a binomial distribution with $b(x; 5, p)$
If $P(x = 0) = \frac{244}{1043}$ find $P(x = 3)$ 4

SECTION-III (PRACTICAL)

10. Attempt any three parts. **3 × 5 = 15**

(A) Find the median and mode for the following frequency distribution of 100 students at a certain examination:-

Marks	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 - 99
Frequency	2	3	11	20	32	25	7

(B) Find the first four moments about mean for the following frequency distribution:-

x	12	14	16	18	20	22
f	1	4	6	10	7	2

(C) Compute the Index Number for 2009 taking 2008 as base year using weighted average of relative method.

	Price		
Commodities	2008	2009	Weight
A	20	30	60
B	12	18	30
C	8	10	25

(D) A random variable X has the probability distribution given below:-

x	– 2	3	1
$f(x)$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{1}{6}$

Find (i) $E(X)$ (ii) $E(X^2)$ and prove that (iii) $E(2x + 5) = 2E(X) + 5$

(E) Four dice are rolled 405 times and a throw of 3 or 4 is regarded as a success.
Find the expected frequencies for 0, 1, 2, 3 and 4 successes.