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Inter-(Part-I)-A-2015

Roll No._____ to be filled in by the candidate

(OLD PATTERN)

Paper Code	2	4	9	3

Session; 2011-2013

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. The parameters of binomial distribution are:

(A) p and q **(B)** q and n **(C)** n and p **(D)** n, p, q

2. For the positively skewed binomial distribution:

(A) p = 0 **(B)** p > 0.5 **(C)** p < 0.5 **(D)** p = 0.5

3. In hypergeomatric distribution the trials are:

(A) independent **(B)** dependent **(C)** both A and B **(D)** none of these

4. The grouped data is also called:

(A) raw data **(B)** primary data **(C)** secondary data **(D)** quantitative data

5. The process of arranging data into rows and columns is called:

(A) array **(B)** classification **(C)** tabulation **(D)** frequency distribution

6. Data arranged in order of magnitude is called:

(A) raw data **(B)** array data **(C)** grouped data **(D)** frequency distribution

7. G.M of the values -2, 4, -3, 6, 0 is:

(A) -3 **(B)** 0 **(C)** 3 **(D)** can not be computed

8. Which is appropriate average for finding the average speed of a journey?

(A) Mean **(B)** G.M **(C)** H.M **(D)** weighted mean

9. If the third moment about mean $m_3=0$ the distribution is:

(A) meso kurtic **(B)** positively skewed **(C)** negatively skewed **(D)** symmetrical

10. If the moment co-efficient of kurtosis b2=3 the distribution is:

(A) Platy kurtic **(B)** Meso kurtic **(C)** Symmetrical **(D)** Positively skewed

11. For a symmetrical distribution:

(A) $\beta_1 = 0$ **(B)** $\beta_1 = 3$ **(C)** $\beta_2 = 3$ **(D)** both a and b

12. Index numbers for base period is always taken as:

(A) one **(B)** zero **(C)** 200 **(D)** 100

13. The most suitable average for index number is:

(A) A.M **(B)** G.M **(C)** H.M **(D)** Median

14. For two mutually exclusive events A and B P(A)=0.2, P(B)=0.4 then P(AUB) is:

(A) 0.8 **(B)** 0.2 **(C)** 0.6 **(D)** 0.5

15. If P(AUB)=P(A)+P(B) then A and B are:

(A) mutually exclusive **(B)** independent **(C)** not mutually exclusive **(D)** none of these

16. If X and Y are random variables then E(X-Y) is equal to:

(A) E(X) + E(Y) **(B)** E(X) - E(Y) **(C)** X - E(Y) **(D)** E(X) - Y

17. Random variable is also called:

(A) chance variable **(B)** stochaotic variable **(C)** constant **(D)** both a and b

Roll No._____ to be filled in by the candidate. **(OLD PATTERN)** | Subject Code | 2 | 4 | 9 |

Session; 2011-2013

Statistics (Essay type)

Time: 2:40 Hours **SECTION-I** **Marks: 68**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define statistics.
ii. Differentiate between population and sample.
iii. What are the qualities of a good average?
iv. Write any two properties of arithmatic mean.
v. Define weighted index numbers.
vi. Define geometric mean.
vii. Define an index number.
viii. Discuss fixed base method.
ix. Find A.M. Given x=10+5u, $\sum fu = 46$ and n=125.
x. If mode=25 and median=30 then find approximate value of mean.
xi. Compute base year weighted index number for the data: $\sum p_o q_o = 35310, \sum p_1 q_o = 41140.$
xii. If Paasche's index number is 105.72 and Laspeyre's index number is 107.22, then find Fisher's index number.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Q_1=25, Q_3=75, both are equidistant from median. Find median and mode.
ii. $\sum X = 180, \sum X^2 = 6660, n = 5.$ Find coefficient of variation.
iii. What are the main objectives of classification.
iv. Define the term tabulation.
v. X=4, 6, 8, 10, 12. Find mean deviation from median.
vi. Define moments about mean.
vii. Differentiate between absolute and relative dispersion.
viii. Find probability of zero tail with 6 coin.
ix. Define independent events.
x. State multiplication law of probability for dependent events.
xi. Find probability of sum of 10 with two dice.
xii. Mean=50, Median=48, S.D=10. Find coefficient of skewness.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. In a binomial distribution mean=3, standard deviation=1.5. Find n and p.
ii. Write down the mean and variance of the hypergeometric distribution.
iii. Define binomial random variable.
iv. What is discrete random variable?
v. What is probability density function?
vi. State two laws of expectation.
vii. Given X=1, 2, 3 and P(X)= C, 4C, 3C. Find the value of C.
viii. Define hypergeometric experiment.
ix. Find $E(X^2)$ from the following: X: 0, 1, 2; P(X): 1/4, 2/4, 1/4.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Calculate geometric mean for the following ungrouped data of the percentage changes in the weight of eight animals: 45, 30, 35, 40, 44, 32, 42, 37. **4**

(b) The given table shows the distribution of the maximum load in short tons supported by certain cables produced by a company. Determine median and mode. **4**

Maximum Loads	9.3 - 9.7	9.8 - 10.2	10.3 - 10.7	10.8 - 11.2	11.3 - 11.7	11.8 - 12.2	12.2 - 12.7	12.8 - 13.2
No. cables	2	5	12	17	14	6	3	1

6. (a) Given the following results. Find combined co-efficient of variation. **4**
n_1=100, S_1=2.4, $\overline{X}_1$=12.5, n_2=120, S_2=4.2, $\overline{X}_2$=15.8, n_3=135, S_3=3.7, $\overline{X}_3$=10.5

(b) Pearson co-efficient of skewness of a distribution is 0.32 and its S.D is 6.5 and mean is 29.6. Find mode and median. **4**

7. (a) Construct index numbers by using chain base method. **4**

Items	1958	1960	1961
A	10	12	13.5
B	16	16.5	17
C	18	18.5	19
D	20	21	21.5

(b) A pair of dice is thrown. If the two numbers appearing are different. Find the probability that:
(i) The sum is 6. (ii) The sum is four or less.

8. (a) A continuous random variable X has a density function f(x)= (x+1)/8 for X=2 to X=4. Find (i) P(X<3.5) (ii) P(X=1.5) **4**

(b) If $f(x) = \frac{6 - |7 - X|}{36}$ for X=2, 3, 4, ..., 12. then find the mean and variance of the random variable X. **4**

9. (a) If 20% of the bolts produced by machine are defective, determine the probability that of 5 bolts chosen at random: (i) 2 bolts are defective (ii) at least 3 bolts are defective **4**

(b) A bag contains 5 white and 7 black balls. If 3 balls are drawn without replacement. What is the probaility that: (i) all are white (ii) All are of the same colour **4**

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Roll No._____to be filled in by the candidate

Inter-(Part-I)-A-2015

(NEW PATTERN)

Paper Code	6	1	8	3

Sessions; 2012-2014, 2013-2015 & 2014-2016

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. In binomial experiment, the trails are:

(A) constant **(B)** independent **(C)** dependent **(D)** none of these

2. If n=10 and P=0.5 then mean of binomial distribution:

(A) 10 **(B)** 5 **(C)** 0.5 **(D)** 0.25

3. Hypergeometric distribution become binomial distribution when:

(A) N=n **(B)** $n \longrightarrow \infty$ **(C)** $N \longrightarrow \infty$ **(D)** N<n

4. The life time of T.V tube is a:

(A) Discrete variable **(B)** Continuous variable **(C)** Constant **(D)** Qualitative variable

5. The group data are called:

(A) Primary data **(B)** Secondary data

(C) Discrete frequency distribution **(D)** Difficult to tell

6. If the number of workers in a factory is 256 then the number of classes will be:

(A) 8 **(B)** 9 **(C)** 10 **(D)** 12

7. If $\bar{X}$=100 and Y=2x-200 then $\bar{Y}$ will be:

(A) 2 **(B)** 0 **(C)** 100 **(D)** 200

8. if $\bar{X}$=25 which of the following will be least?

(A) $\sum(X-27)^2$ **(B)** $\sum(X-25)^2$ **(C)** $\sum(X-22)^2$ **(D)** $\sum(X-0)^2$

9. The 1st moment about X=0 of a distribution is 12.08 then mean is:

(A) 10.80 **(B)** 10.08 **(C)** 12.08 **(D)** 12.88

10. The variance of -5, -5, -5, -5 is:

(A) 5 **(B)** 0 **(C)** -5 **(D)** 4

11. The mean deviation of series 2,4,6 is:

(A) 0 **(B)** 1.33 **(C)** 4 **(D)** 12

12. The price relatives computed by chain base method are called:

(A) price relatives **(B)** chain indices **(C)** link relatives **(D)** none of them

13. Index number for base period always taken as:

(A) 1000 **(B)** 100 **(C)** 200 **(D)** zero

14. The probability of getting 7 in throwing a dice is:

(A) 1/7 **(B)** 1/6 **(C)** 0 **(D)** 1/3

15. If P(B/A)=0.5 and $P(A \cap B)$=0.4 then P(A) will be equal to:

(A) 0.40 **(B)** 0.5 **(C)** 0.80 **(D)** 1

16. $\int_{-\infty}^{\infty} f(x)\,dx$ is always equal to:

(A) zero **(B)** one **(C)** E(x) **(D)** f(x)+1

17. The probability function of a random variable is defined as:

X	-1	-2	0	1	2
f(x)	K	2K	3K	4K	5K

Then K is equal to:

(A) zero **(B)** one **(C)** 1/15 **(D)** 1/5

Roll No._____to be filled in by the candidate. **(NEW PATTERN)**

Subject Code	6	0	1	8

Sessions; 2012-2014, 2013-2015 & 2014-2016

Statistics (Essay type)

Time: 3:10 Hours **Marks: 83**

SECTION-I

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What is meant by qualitative variable?
ii. Give three uses of statistics.
iii. If $X_1=2$ and $X_2=8$, Show that A.M> G.M.
iv. If Y=5+6x/2, find $\overline{Y}$, if $\overline{X}=2$.
v. Calculate G.M of 1, 1, 8.
vi. Correct $D_4=P_2$, $P_{25}=Q_3$.
vii. How is the average defined?
viii. Define price relatives.
ix. If $\sum p_1q_o = 505, \sum p_oq_o = 425$, Which index number can be found and calculated?
x. Which average is most suitable in connection with index numbers?
xi. Given W=20, 25, 30, 40, I=100, 105, 110, 120. Find consumer's price index number.
xii. What are "Quantity index number"?

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. The frequencies of 5 classes are 2, 5, 7, 10, 16. Find cumulative frequencies and relative frequencies.
ii. If a series comprises 10 values, each value is equal to 8, then what will be the mean and variance of the series?
iii. Given the following sums n=15, $\sum X = 480, \sum X^2 = 15735$. Find C.V.
iv. Define Histogram.
v. What is absolute dispersion?
vi. Define co-efficient of variation.
vii. Define the term skewness.
viii. Define variance.
ix. Define sample point.
x. What is Venn diagram?
xi. A coin is tossed twice. Find the probability of one head.
xii. Define equally likely events.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. In binomial distribution n=5, p=0.2, Find co-efficient of variation.
ii. If N=10, N-K=4, n=5. Find variance of the hypergeometric distribution.
iii. Define the binomial probability distribution.
iv. What is a random variable?
v. Write down two properties of mathematical expectation.
vi. What does "p.d.f" stand for?
vii. If $E(x)=3$ and $E(x^2)=12$, then find variance and S.D of x.
viii. Given X=0, 1, 2, P(x)=4C, 3C, C. Find value of C.
ix. Write any two properties of the hypergeometric experiment.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Calculate harmonic mean of the variable X from the following data.

u=(x-3.5)/0.5	-3	-2	-1	0	1	2	3
f	15	38	65	92	80	40	20

(b) Calculate median, 3rd decile using frequency distribution given below.

u	-2	-1	0	1	2
f	7	50	80	60	3

Where U=(x-130)/20

6. (a) Calculate first four moments about mean for the following set:

45	32	37	46	39	36	41	48	36

(b) The ungrouped data is given. Calculate mean deviation from mean:

2	5	6	6	8	9	12	13	16	23

7. (a) Compute Chain Index numbers for the following data taking 1997 as base year.

Years	1997	1998	1999	2000	2001	2002	2003
Prices	180	185	194	200	204	218	220

(b) A card is selected at random from a deck of 52 playing cards. Find the proabability that card is king or queen.

8. (a) $P(x)=\binom{4}{x}(½)^x(½)^{4-x}$ **where x=0, 1, 2, 3, 4.**

Find the probability distribution and calculate E(X).

(b) Given a continuous random variable X. The density function of X is given by: $f(x)=\frac{2(1+x)}{27}$ *for* $2\le x\le 5$

Find (i) P(x < 4) (ii) $P(3\le x\le 5)$

9. (a) In binomial distribution if n=5 and P=1/3, find (i) $P(x\le 4)$ (ii) $P(x\ge 3)$

(b) Four balls are drawn from a bag containing 5 red and 6 black balls. What is the probability that:

(i) Two are red (ii) All are black.

Section -III (Practical)

NOTE: Answer any three parts from the following. **5x3=15**

10.A. Find arithmetic mean from the given data: **5**

Marks	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39
f	6	12	15	7	4

B. Calculate quartile deviation from the following data: **5**

Marks	21 - 40	41 - 60	61 - 80	81 - 100	101 - 120
f	5	12	15	13	10

C. Following data is given, calculate Paasche's price index number taking 1970 as base: **5**

Commodity	Prices		Quantity	
	1970	1971	1970	1971
A	5	20	6	16
B	6	15	8	18
C	10	12	12	10

D. A random variable has the following probability distribution. **5**

x	0	1	2	3
P(x)	0.1	0.2	0.3	0.4

Find (i) E(x) (ii) var(x)

E. Form a complete binomial distribution with parameters n=5 and P=1/3 **5**

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Roll No._____ to be filled in by the candidate

Paper Code	2	4	9	1

Session; 2015-2017

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. A quantity computed from a population is called:
   (A) constant **(B)** variable **(C)** parameter **(D)** statistic
2. The process of systematic arrangement of data into rows and columns is called:
   (A) classification **(B)** tabulation **(C)** stub **(D)** box-head
3. The graph of a cumulative frequency distribution is known as:
   (A) Histogram **(B)** Ogive **(C)** Pie-chart **(D)** none of these
4. The median of the data -2, 0, 2, 5, -1 is:
   (A) 2 **(B)** 4 **(C)** 0 **(D)** -2
5. Which of the following average can have more than one value:
   (A) Mean **(B)** Median **(C)** Mode **(D)** G.M
6. The first moment about mean is:
   (A) mean **(B)** zero **(C)** one **(D)** variance
7. If $Q_1=10$ and $Q_3=30$, then coefficient of quartile deviation is:
   (A) 3 **(B)** 1/2 **(C)** 2/3 **(D)** 1
8. When $\beta_2>3$ then the distribution is called:
   (A) Mesokurtic **(B)** Platy kurtic **(C)** Lepto kurtic **(D)** normal
9. Current year quantities are used as weights in:
   (A) Laspeyre's **(B)** Paasche's **(C)** Fisher's **(D)** chain index numbers
10. In chain base method the base period is:
    (A) fixed **(B)** not fixed **(C)** constant **(D)** none of these
11. If two dice are rolled, the possible outcomes are:
    (A) 6 **(B)** 36 **(C)** 1 **(D)** 16
12. If A and B are two mutually exclusive events, Then $P(A\cap B)=$
    (A) 1/2 **(B)** 1 **(C)** σ **(D)** ϕ
13. For a continuous variable "x" $\int_{-\infty}^{+\infty} f(x)dx = ?$
    (A) μ **(B)** zero **(C)** 1 **(D)** ∞
14. If x is a random variable, then E(5x+2) is:
    (A) 5 E(x) **(B)** 5 E(x)+2 **(C)** 5+E(x) **(D)** 2 E(x)+5
15. Binomial distribution has parameters:
    (A) 2 **(B)** 3 **(C)** μ **(D)** σ^2
16. In hypergeometric distribution, the successive trails are:
    (A) Independent **(B)** dependent **(C)** some times independent **(D)** none of these
17. The mean of the hypergeometric distribution is:
    (A) $\frac{nN}{k}$ **(B)** $\frac{n+k}{N}$ **(C)** $\frac{nk}{N}$ **(D)** $\frac{Nk}{n}$

Roll No._____ to be filled in by the candidate.

Subject Code	2	4	9

Statistics (Essay type)

Session; 2015-2017

Time: 2:40 Hours **Marks: 68**

SECTION-I

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define Descriptive Statistics.
ii. Define secondary data.
iii. Define weighted mean.
iv. Define harmonic mean.
v. Define weighted index number.
vi. What are quantity index numbers?
vii. Define a value index number.
viii. Write the formula for Fisher's Index Number.
ix. Describe the empirical relation between mean, median and mode.
x. The sum of deviations of 15 values from 20 is 45. Find A.Mean.
xi. For a certain distribution if $\sum(x-15)=5, \sum(x-18)=0 \, and \, \sum(x-21)=-21$, what is the value of mean and Why?
xii. How many methods are used for selection of base period?

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What will be the coefficient of variation if $\sum fx^2=75000, \sum fx=2500 \, and \, \sum f=100$?
ii. For any two events 'A' and 'B' the probability of A=0.6 and Probability of B=0.8. Find P(AUB).
iii. What is tabulation?
iv. What is frequency polygon?
v. Define the term disperssion.
vi. If var(x)=16, then find var(2x) and var(3x-20).
vii. Define moments.
viii. What do you know about skewness?
ix. Give the Bowley's formula of coefficient of skewness.
x. Write mathematical definition of probability.
xi. What are equally likely events?
xii. From a pack of 52 cards, find the probability of a black card.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. What is meant by mathematical expectation of a random variable?
ii. A random variable 'x' has a binomial distribution with n=5 and p=0.2. Find P(x=2).
iii. Write down parameter, mean and variance of hypergeometric distribution.
iv. Define continuous random variable.
v. Write down any four laws of mathematical expectation.
vi. What is meant by probability function?
vii. Given X=0, 1, 2 and P(x)=5/40, 25/40, 10/40. Find E(x).
viii. Define Bernoulli trial.
ix. Given N=10, n=2 and k=3. Find P(x=0).

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. **(a)** Find the geometric mean from the following frequency distribution.

x	2	3	4	5	6
f	5	7	8	3	2

(b) Reciprocals of 8 values of x are 0.0667, 0.1111, 0.0833, 0.0556, 0.0500, 0.0357, 0.0278, 0.0222. **4**
Calculate median of x.

6. **(a)** Find the coefficient of S.D. from the following data: **4**

x	5	10	15	20	25	30
f	3	7	20	10	6	4

(b) In a frequency distribution, the coefficient of skewness is 0.6. If the sum of upper and lower quartiles is 100 and median is 38. Find the value of the upper quartiles.

7. **(a)** Calculate Index numbers of prices taking the average of the prices of 1st 5 years as base year from the following data. **4**

Years	1960	1961	1962	1963	1964	1965	1966	1967
Prices	40	45	48	50	52	54	56	60

(b) Two good dice are rolled. Find the probability of: (i) The sum is exactly seven (ii) The two dice show the same number.

8. **(a)** Probability distribution of a random variable(x) is given as: **4**

x	1	2	3	4	5
P(x)	0.1	0.3	a	0.2	0.1

(i) Find the value of 'a'. (ii) Find probability distribution of Y=3x+5

(b) Find E(x) and Var(x) for following probability distribution.

x	0	1	2	3
P(x)	0.1	0.2	0.3	0.4

9. **(a)** An event has probability P=2/5. Find the complete binomial distribution when n=4. **4**

(b) Given that 'x' is a hypergeometric random variable with N=8, n=3 and k=5. Compute $P(x \leq 3)$. **4**

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Inter-(Part-I)-A-2016

Roll No._____to be filled in by the candidate	Paper Code	6	1	8	1

Sessions; 2012-2014, 2013-2015 & 2014-2016

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. Data used by an agency which originally collected them are:
(A) primary data **(B)** raw data **(C)** secondary data **(D)** grouped data

2. The process of arranging data into rows and columns is called:
(A) frequency distribution **(B)** classificaiton
(C) tabulation **(D)** array

3. The number of important basis of classification are:
(A) 2 **(B)** 3 **(C)** 4 **(D)** 5

4. The most central value of arranged data is:
(A) Mode **(B)** Median **(C)** Mean **(D)** G.M.

5. The mean of first "n" natural numbers is:
(A) $\frac{n(n+1)}{2}$ **(B)** $\frac{(n+1)}{2}$ **(C)** $\frac{(n-1)}{2}$ **(D)** $\frac{n}{2}$

6. If S.D(X)=5, then $S.D.\frac{(2X+5)}{2}$ is equal to:
(A) 5 **(B)** 10 **(C)** 15 **(D)** 7.5

7. If the third moment about the mean is zero (m_3=0), then the distribution is:
(A) mesokurtic **(B)** pisitively skewed **(C)** symmetrical **(D)** negatively skewed

8. If $\bar{X}$=5, which of the following expressions is minimum?
(A) $\sum(X-25)^2$ **(B)** $\sum(X-5)^2$ **(C)** $\sum|X-5|$ **(D)** $\sum|X-25|$

9. Link relative is equal to:
(A) $\frac{P_n}{P_o}\times 100$ **(B)** $\frac{P_n}{P_{n-1}}\times 100$ **(C)** $\frac{P_n}{P_{n+1}}\times 100$ **(D)** none of these

10. Consumer's price index numbers are:
(A) un-weighted **(B)** weighted **(C)** simple **(D)** none of these

11. Two events A and B are called mutually exclusive, if:
(A) AUB=ϕ **(B)** $A\cap B=\phi$ **(C)** $A\cap B=S$ **(D)** $(A\cap B)=1$

12. When two coins are tossed simultaneously, probability(one head) is:
(A) 1/4 **(B)** 1/2 **(C)** 3/4 **(D)** 1.0

13. If y=ax+b, where a and b are two constants, then var(y) is:
(A) a var(x)+b **(B)** var(x)+b **(C)** a^2 var(x) **(D)** a var(x)

14. If E(x)=4, then arithmatic mean will be:
(A) 4 **(B)** 8 **(C)** 0 **(D)** 1

15. In a binomial distribution, the range of X is:
(A) 0 to ∞ **(B)** 0 to n **(C)** -1 to ∞ **(D)** undefined

16. in a binomial distribution for n=20, P=3/5, then variance of this distribution is:
(A) 60 **(B)** 12 **(C)** 4.8 **(D)** 0

17. In hypergeometric distribution K=3, N=6, n=2, then mean is:
(A) 2 **(B)** 3 **(C)** 1 **(D)** 4

Roll No._____ to be filled in by the candidate.

Subject Code	6	0	1	8

Sessions; 2012-2014, 2013-2015 & 2014-2016

Statistics (Essay type)

Time: 3:10 Hours **Marks: 83**

SECTION-I

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define sample and population.
ii. What is frequency distribution?
iii. Give any two merits of mode.
iv. Define deciles.
v. Define geometric mean.
vi. What is the empirical relation between mean, median and mode?
vii. What are the uses of index numbers?
viii. What are index numbers?
ix. Find the median in a moderately skewed distribution when mean=10, and mode=15.
x. Given $\sum WI = 500 \, and \sum W = 5$. Find consumer price index number.
xi. Given $\sum p_o q_o = 1000, \sum p_o q_n = 800, \sum p_n q_n = 1360$. Find current year weighted index.
xii. Explain the relationship between Laspeyre's Index, Paasche's Index and Fisher's Index.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What would be the shape and name of the frequency distribution if: (a) mean=median=mode (b) mean>median>mode.
ii. If lower quartile is 20 and quartile deviation is 30. Find upper quartile.
iii. Given mean =100, mode=95 and standard deviation=10. Find co-efficient of skewness.
iv. If A and B are two independent events such that P(A)=0.2 and P(B)=0.15 then find $P(A \cap B)$.
v. What is classification?
vi. Define frequency distribution.
vii. Define the term dispersion.
viii. Define absolute dispersion.
ix. Write any two properties of standard deviation.
x. Define sample space.
xi. Define mutually exclusive events.
xii. Define conditional probability.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Find mean and standard deviation for the following discreet distribtuion f(x)=1, x=5.
ii. If a continuous random variable X has probability density function f(x)=a(x+1) for $2 \le x \le 5$, then find the value of "a".
iii. If E(x)=1.1 and $E(x^2)$=2.1 then find co-efficient of variation of "x".
iv. Define mathematical expectation and write its at least two properties.
v. If X is a binomial random variable with mean=1.44 and standard deviation=0.96 then find P(x=2).
vi. Write down the equation of the hypergeometric distribtuion and its mean and variance.
vii. Define binomial experiment.
viii. Define probability density function and write its properties.
ix. Given N=10, n=4, K=7, then find S.D.(X).

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) The following data has been obtained from a frequency distribution of a continuous variable 'X' after making the substitution: $U = \frac{X - 136.5}{6}$. Show that G.M. is less than A.M.?

U	-4	-3	-2	-1	0	1	2	3
f	2	5	8	18	22	13	8	4

(b) Determine median and mode from the following data:

Groups	9.8 - 10.2	10.3 - 10.7	10.8 - 11.2	11.3 - 11.7
f	5	12	17	14

6. (a) Find the mean deviation from the following data:

Classes	10 - 14	15 - 19	20 - 24	25 - 29
f	12	10	11	8

(b) For the following data, find combined standard deviation and combined co-efficient of variation.

$n_1 = 50; \ \bar{x}_1 = 63; \ s_1 = 9, \ n_2 = 40; \ \bar{x}_2 = 54; \ s_2 = 6$.

7. **(a)** Construct the index number for 1963 assuming 1953 as base by: (i) Laspeyre's formula (ii) Paasche's formula

Items	1953		1963	
	Price	Quantity	Price	Quantity
A	2	50	10	40
B	3	10	8	5
C	4	5	4	5

(b) A coin is tossed twice. Find the conditional probability of getting two heads given at least one head.

8. **(a)** A r.v. 'x' has the following probability distribution.

X	1	2	3	4
P(X)	2/9	3/9	1/9	3/9

Find mean and S.D. of x.

(b) For a continuous r.v. 'x' for(x)= kx ; $0 \le x \le 2$. Find (i) value of k (ii) P(0.5<x<1.5)

9. **(a)** Find mean and variance of the binomial distritbution $(q+p)^3$.

(b) An urn contains 5 balls. Two of them are red and 3 black balls. If three balls are drawn without replacement, find the mean and variance of the distribution of black balls.

Section -III (Practical)

NOTE: Answer any three parts from the following. **5x3=15**

10.A. Find median and mean to the given data. **5**

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
f	4	9	20	11	6	3

B. Given the following results $n_1 = 100, \bar{x}_1 = 126, s_1 = 2.4, n_2 = 120, \bar{x}_2 = 158, s_2 = 4.2$. **5**

Find combined co-efficient of variation.

C. Find the chain index number for the price data given below. The price of the commodities are **5**

in Rs. per 40 kg taking 1980 as base.

Years	Commodities			
	Wheat	Rice	Maize	Cotton
1980	58	118	27	80
1981	60	120	30	90
1982	75	130	30	95
1983	90	150	40	100

D. Given the following discreet probability distribution. **5**

x	0	1	2	3	4	5
P(x)	6/36	10/36	8/36	6/36	4/36	2/36

Find (i) $E[x-E(x)]^2$ (ii) Co-efficient of variation.

E. If you toss a fair dice 6 times. What is probability of getting even numbers, also find the probability distribution **5**

of even numbers on 6 dices.

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Roll No._____ to be filled in by the candidate	Paper Code	2	4	9	1

Sessions;2015-2017&2016-2018

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. The number of vowels in the word statistics are:

(A) Discrete data **(B)** Continuous data **(C)** Qualitative data **(D)** Infinite

2. The data already collected by some one are called:

(A) Raw data **(B)** Secondary data **(C)** Arranged data **(D)** Fictitious data

3. The graph of the time series is called:

(A) Historigram **(B)** Histogram **(C)** Ogive **(D)** Sector diagram

4. Which of the following averages are affected by extreme values?

(A) A.M **(B)** G.M **(C)** H.M **(D)** Median

5. Sum of the deviations from Mean is:

(A) one **(B)** zero **(C)** <0 **(D)** >0

6. When $b_2<3$ then the distribution is called:

(A) Mesokurtic **(B)** Platykurtic **(C)** Leptokurtic **(D)** Normal

7. The variance of 7,7,7,7,7 is:

(A) 7 **(B)** $(7)^2$ **(C)** 0 **(D)** $\sqrt{7}$

8. For a symmetrical distribution:

(A) $b_1>0$ **(B)** $b_1<0$ **(C)** $b_1=0$ **(D)** $b_1=3$

9. For computing chain index Numbers we compute:

(A) Price relatives **(B)** Link relatives **(C)** Weighted indices **(D)** Fixed base

10. Base year quantities are used as weights in computing:

(A) Laspeyre's Index **(B)** Paasche's Index **(C)** Fisher's Index **(D)** Chain Index

11. A single letter is selected from the word "PROBABILITY".Then the probability of vowels is:

(A) 2/11 **(B)** 3/11 **(C)** 4/11 **(D)** 7/11

12. If an event is not affected by the other event,then they are called:

(A) Mutually exclusive **(B)** Independent **(C)** Dependent **(D)** Equally likely

13. Var(2x+5)=

(A) 2 var(x) ± 5 **(B)** 4 var(9x+25) **(C)** 4 var(x) **(D)** 4 var(x)-25

14. The probability function cannot be:

(A) <0 **(B)** =0 **(C)** >0 **(D)** ≠ 0

15. A binomial distribution has variance:

(A) nq **(B)** np **(C)** npq **(D)** $\sqrt{npq}$

16. If in a binomial distribution P=0.5 then the distribution is:

(A) positively skewed **(B)** Negatively skewed **(C)** Symmetrical **(D)** Non-symmetrical

17. In a hypergeomatric experiment the successive trials are:

(A) Independent **(B)** Dependent **(C)** Infinite **(D)** Exhaustive

Roll No._____to be filled in by the candidate.

Statistics (Essay type)

Sessions;2015-2017&2016-2018

Time: 2:40 Hours **SECTION-I** **Marks: 68**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What is meant by statistics?
ii. Differentiate between qualitative and quantitative data.
iii. Define and explain "Average".
iv. Discuss demerits of arithmatic mean.
v. Define Median.
vi. Compute $\sum x$ if $\bar{x}=5$ and n=10.
vii. Define and explain quartiles.
viii. Define simple index number.
ix. Explain fixed base method.
x. If $\sum P_n q_o = 600$, $\sum P_o q_o = 150$ compute Laspeyr's price index.
xi. Give some uses of index number.
xii. If $\sum P_n q_n = 460$, $\sum P_o q_n = 115$ .Find Paasch's price index.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What is simple classification and two way classification?
ii. If var(x)=5 and y=2x+5 then what will be variance of y?
iii. Write any two properties of standard deviation.
iv. What is mean deviation?
v. Define the term range.
vi. Define the term class interval.
vii. Define the term absolute measure of dispersion.
viii. Write down the various formulas of variance.
ix. Distinguish between simple and compound events.
x. Explain the concept probability.
xi. Define not mutually exclusive events.
xii. Explain the term dependent events.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. In a binomial distribution,n=10,p=0.3.Find mean and variance.
ii. Write down the properties of a discrete probability distribution.
iii. If E(x)=5 and $E(x^2)=50$ find, σ^2 .
iv. Find 'k' for probability distribution

x:	o	1	2
P(x):	k	2k	3k

v. Write down the formula of mean and variance of hypergeometric distribution.
vi. What is binomial experiment?
vii. How can be random numbers generated?
viii. What is hypergeometric random variable?
ix. Write down the formula of E(x) and $E(x^2)$.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Calculate the mode for the given data.

Groups	15-19	20-24	25-29	30-34	35-39
f	4	8	12	9	3

(b) Calculate Harmonic mean for the following data. 4

Classes	10-19	20-29	30-39	40-49	50-59
f	2	3	8	11	3

6. (a) Calculate the mean deviation from mean and mean deviation from median for the following data. 4
2,6,9,12,8,13,5,6,23,16

(b) Find coefficient of Q.D from the following data. 4

Midpoint	15	25	35	45	55
f	3	7	10	8	2

7. (a) Given the prices of (3) three commodities,compute price index number by simple aggregative method taking the year 2000 as base: 4

Year	Commodities		
	A	B	C
2000	4	10	20
2001	4	6	23
2002	7	9	25
2003	8	10	30

(b) Three uniform coins are tossed.Find the following probabilities. 4
(i) Only one tail. **(ii)** atleast one head. **(iii)** Head on first coin appeared.

8. (a) Three balls are drawn from a bag containing 5 white and 3 black balls.If'x' denotes the number of white balls drawn from the bag then find the probability distribution of x. 4

(b) A continuous random variable x that can assume values between x=2 and x=5 has a density function by. 4

$$f(x)=\frac{2}{27}(x+1)$$ find **(i)** P(x<4) **(ii)** P(3<x<4)

9. (a) In a binomial distribution n=5,p=$\frac{1}{4}$,find **(i)** P(x=0) **(ii)** $P(x\leq 3)$. 4

(b) Given that x is a hypergeometric random variable with N=8, n=3 and k=5.Compute $P(x\leq 3)$. 4

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Inter-(Part-I)-A-2017

Roll No._____to be filled in by the candidate	Paper code	6	1	8	1

Sessions;2013-2015&2014-2016

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. "π" is a:
(A) constant (B) parameter (C) statistic (D) co-efficient

2. Total of relative frequency is always:
(A) One (B) Two (C) Half (D) 100

3. Total angle of pie-chart is:
(A) 270° (B) 300° (C) 320° (D) 360°

4. $Q_2=D_5=P_{50}=$
(A) Mean (B) Median (C) Mode (D) H.M

5. If $\sum(x-50)=0$,then $\bar{x}$=....
(A) 10 (B) 250 (C) 50 (D) None of these

6. The first moment about mean is:
(A) zero (B) one (C) two (D) none of these

7. Half of the difference between upper and lower quartiles is called:
(A) M.D (B) Q.D (C) S.D (D) variance

8. If y=3x+7 and $\sigma_x^2=4$,then σ_y^2 is:
(A) 6 (B) 36 (C) 48 (D) 27

9. In index number technique,the most suitable average is:
(A) A.M (B) G.M (C) median (D) mode

10. Price relatives can be obtained dividing P_n by:
(A) P_o (B) P_{n-1} (C) q_o (D) q_{n-1}

11. 8_{C_2}= ———
(A) 56 (B) 28 (C) 35 (D) 8

12. When two coins are tossed,the all possible outcomes are:
(A) four (B) five (C) eight (D) two

13. for a discrete r.v.x if "k" is a constant then var(-k)=_____:
(A) k (B) k^2 (C) zero (D) -k

14. Given var(x)=3,var(y)=5 then var(x+y)=_____:
(A) 15 (B) 14 (C) 34 (D) 8

15. The variance of binomial distribution is:
(A) nP (B) nq (C) pq (D) npq

16. The mean of hypergeomatric distribution is:
(A) $\frac{nk}{N}$ (B) $\frac{nN}{K}$ (C) $\sqrt{npq}$ (D) $\frac{n+k}{N}$

17. Hypergeomatric r.v is:
(A) Discrete (B) Continuous (C) Negative (D) None of these

Roll No._____ *to be filled in by the candidate.*

Sessions;2013-2015&2014-2016

Statistics (Essay type)

Time: 3:10 Hours **SECTION-I** **Marks: 83**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define statistics.
ii. Write any two properties of A.M.
iii. Define Median with formula.
iv. If sum of deviations of 15 values from 20 is 45.Find A.M.
v. If Mode=15 and Mean=12,find Median.
vi. Define Geometric Mean.
vii. Define an Index Number.
viii. What is Consumer Price Index Number?
ix. Define Link relatives.
x. Find the current year weighted index for given data.Given $\sum p_n q_n = 2260, \sum p_o q_n = 2230$
xi. If Laspeyre's Index number=105.4 and Paasche's Index number=103.2,find the Fisher's Index Number.
xii. Define a population.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What is classification?
ii. Find the minimum and maximum sum of dots when a pair of dice is rolled.
iii. If the first moment about the number 2 is equal to 5.What is the mean?
iv. Given $\bar{x} = 10$ and var(x)=4,find $\bar{y}$ and var(y) when $y = \frac{1}{3}(4+3x)$.
v. Name the distribution if $b_1=0, b_2=2$.
vi. What is variance?
vii. Define the term dispersion.
viii. What is positive skewness?
ix. Define sample space.
x. State the difference between simple and compound events.
xi. What is an array?
xii. What is the range of probability of an event?

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Define discrete random variable with an example.
ii. Write down the properties of the distribution function.
iii. Write down hypergeometric probability function,its mean and variance.
iv. Given E(x)=0.60, var(x)=1.4 and if y=3x+4 then find E(y) and Var(y).
v. Discuss the statement that in binomial distribution mean=5 and variance=5
vi. If x follows hypergeometric random variable i.e $x \sim h(11,5,7)$ then find $P(x \leq)1$.
vii. Explain probability mass of function.
viii. Given x=-10,-20,30 and P(x)=2k,3k,5k find P(x<30).
ix. Define binomial experiment.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Calculate median for the following distribution.

Hourly wages	4-6	6-8	8-10	10-12	12-14	14-16
No.of Employees	13	111	182	105	19	7

(b) Calculate harmonic mean for the following data:

x:	2	3	4	5	6
f:	6	10	12	15	7

6. (a) Calculate S.D,variance and C.V for data below:

Classes	10 - 14	15 - 19	20 - 24	25-29	30-34
f	1	4	8	5	2

(b) The first four moments of a distribution about x=4 are 1,4,10 and 45. Calculate:**(i)** Co-efficient of variation **(ii)** b_2

7. **(a)** Find index numbers by chain base method from the following data:

Years	1970	1971	1972	1973	1974	1975
Prices	15	19	21	30	37	38

(b) A and B are two independent events.If P(A)=0.40, P(B)=0.30 Find the probabilities.

(i) $P(A \cap B)$ (ii) $P(A \cup B)$

8. **(a)** If $P(x) = \binom{3}{x}(\frac{1}{4})^x(\frac{3}{4})^{3-x}$ where x=0,1,2,3.Find E(x).

(b) A continuous random variable x has value between 0 and 4.Its density function is given by:

f(x)= $\frac{1}{2}$ -ax where 'a' is a constant.Find the value of a.

9. **(a)** In binomial distribution n=5 P=0.7

(i) Find complete binomial distribution. (ii) Find Mean and variance of the distribution obtained.

(b) A bag contains 5 red and 7 black balls.5 balls are selected at random(without replacement).If x denotes the no.of black balls then find the probability distribution of x.Also find mean and variance of the distribution thus obtained.

Section -III (Practical)

NOTE: Answer any three parts from the following. **5x3=15**

10.A. Find A.M of the following data. **5**

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
f	5	12	15	25	8

B. Calculate **5**

(i) Mean deviation from mean.

(ii) Mean deviation from median,using the following data.

x= 4, 7, 7, 9, 10, 12, 15

C. Give the following information **5**

$\sum p_o q_o = 3600$, $\sum p_1 q_o = 4300$, $\sum p_0 q_1 = 4100$, $\sum p_1 q_1 = 4890$

Show that Fisher's ideal price index number is the G.M of Laspeyre's and Paasche's Index number.

D. If X has the following probability distribution. **5**

X	1	2	3	4	5
P(x)	0.05	0.04	0.59	0.25	0.07

Find (i) E(x) (ii) $E(x^2)$

E. Four dice are tossed 96 times.Find the expected frequencies when throwing of 4,5 or 6 is regarded as a success. **5**

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Roll No._____ to be filled in by the candidate	Paper Code	2	4	9	5

Sessions;2015-2017,2016-2018&2017-2019

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The index for base period is always taken as:

(A) 100 (B) one (C) 200 (D) zero

2. Probability of black queen from 52 cards is:

(A) 4/52 (B) 2/52 (C) 3/52 (D) 5/52

3. The probability of an event always lies between:

(A) -1 and 0 (B) -1 and 1 (C) 0 and 1 (D) 1 and 2

4. Random numbers are sequence of digits from the set:

(A) {0,1,2...9} (B) {1,2...9} (C) {0,1,2...10} (D) {1,2...10}

5. Var(2X+5)=

(A) 2.Var(X)+5 (B) 4.Var(X) (C) 4.Var(X)-25 (D) 4.Var(X)+25

6. If p=q=1/2 the binomial distribution is:

(A) Negatively skewed (B) Positively skewed (C) Symmetrical (D) Non-symmetrical

7. If N=40,n=5,K=4,then mean of hypergeomatric distribution is:

(A) 1 (B) 1/2 (C) 1/4 (D) 1/3

8. If var(X)=3,var(y)=5 and if X and Y are independent variables then Var(X-Y)=;

(A) -2 (B) 2 (C) 8 (D) 34

9. A constant can assume:

(A) One value (B) More than one value (C) Different values (D) No value at all

10. The number of basis for classification is:

(A) two (B) three (C) four (D) five

11. Total of relative frequency is always:

(A) 1 (B) 2 (C) 1/2 (D) 1/4

12. The Median divides the data into:

(A) 2 parts (B) 3 parts (C) 4 parts (D) 10 parts

13. The modal letter of the word "STATISTICS" is:

(A) S (B) T (C) S and T (D) I

14. The range of the scores 19,3,140,25,95 is:

(A) 140 (B) 3 (C) 137 (D) 143

15. Half of the difference between upper and lower quartiles is:

(A) M.D (B) S.D (C) Q.D (D) variance

16. The standard deviation is always computed from:

(A) Mean (B) Median (C) Mode (D) Combined mean

17. The index given by $\frac{\sum p_n q_n}{\sum p_o q_o} \times 100$ is:

(A) Laspeyre's Index (B) Paasche's Index (C) Value Index (D) None of these

Roll No._____ to be filled in by the candidate.

Statistics (Essay type)

Sessions;2015-2017,2016-2018&2017-2019

Time: 2:40 Hours **SECTION-I** **Marks: 68**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What are sources of secondary data?
ii. Define Fixed base method.
iii. What is statistical average?
iv. Enlist the four properties of good average.
v. Find $\sum X$ if $\bar{X}=15, n=10$.
vi. Calculate Geometric Mean of 1,1,8.
vii. Describe the relation between A.M,G.M and H.M.
viii. What does an Index number measure?
ix. What is base period?
x. If $X_1=2, X_2=5, X_3=-2, X_4=5, X_5=-1, X_6=2$, then find $\sum_{i=1}^{3} X_i$, $\sum_{i=1}^{6} X_i$
xi. Given $\sum p_o q_o = 352$, $\sum p_1 q_o = 422$, $\sum p_o q_1 = 402$, $\sum p_1 q_1 = 481$ then find current year weighted index(P_{01}).
xii. Given $\sum IW=8074.5$, $\sum W=60.25$. Find consumer price index.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define Semi-Inter Quartile Range and its Co-efficient.
ii. Given $Q_1=125$ and $Q_3=175$. Find the co-efficient of Quartile deviation.
iii. What is classification?
iv. What is Histogram?
v. Given X=2,4,6. Find Mean deviation from Median.
vi. Explain the term skewness.
vii. Define PlatyKurtic distribution.
viii. Define the standard-deviation.
ix. Define venn-diagram.
x. Write down the definition of probability.
xi. A card is selected from a deck of playing cards. What is the probability that the card is a king or queen?
xii. Suppose $P(A)=\frac{1}{3}$, $P(A \cup B)=\frac{1}{3}$, $P(A \cap B)=\frac{1}{10}$. Find P(B).

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Describe the application of random numbers.
ii. Suppose a person gets Rs.5 for a head and Rs.3 for a tail. How much would you expect him to get per toss, when he plays the game over and over again.
iii. If var(x)=2, var(y)=5 if X and Y are independent then find var(2X-Y).
iv. If E(x)=3, E(Y)=2.5, then find E(X-Y).
v. Write the properties of probability density function.
vi. Write any two properties of binomial distribution.
vii. What is mean and variance of $(q+p)^2$.
viii. Define hypergeometric random variable.
ix. Write any two properties of hyper-geometric distribution.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Find the median from the following data. 4

Groups	10-14	15-19	20-24	25-29	30-34
f	1	4	10	5	2

(b) The reciprocals of x are given below: 4
0.0267, 0.0235, 0.0211, 0.0191, 0.0174, 0.0160, 0.0148.
Calculate Arithmatic Mean and Harmonic Mean.

6. (a) Calculate coefficient of quartile deviation for the following data. 4

Classes	25-50	50-75	75-100	100-125	125-150	150-175
f	10	12	16	17	20	15

(b) The first four moments about x=62 are 1,4,10,46. Find first four moments about mean. 4

7. (a) Compute chain indices for the following data taking 2009 as base year. 4

Year	2009	2010	2011	2012	2013	2014	2015
Prices	1800	1850	1940	2000	2040	2180	2200

(b) A card is selected from a deck of playing cards; Find the probability that: 4
(i) The card is black (ii) The card is queen card (iii) The card is spade card (iv) The card is a face card

8. (a) A committee of size 5 is to be selected at random from 3 women and 5 men. Find the expected number of women in the committee. 4

(b) Let x be a random variable with probability distribution. 4

X	1	2	3	4	5
P(X)	0.125	0.450	0.250	0.050	0.125

Show that E(5x+8)=5E(x)+8.

9. (a) A random variable x has binomial distribution with n=4 and p=0.4. Find the expected number of successes. 4
(b) A committee of size 3 is to be selected at random from 4 women and 6 men. Obtain the probability distribution of the number of men in the committee. 4

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Roll No._____to be filled in by the candidate

Inter-(Part-I)-A-2018

Paper code	6	1	8	5

Session;2014-2016

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. Link relative is equal to:

-(A) $\frac{P_n}{P_0}\times 100$ (B) $\frac{P_{n-1}}{P_n}\times 100$ (C) $\frac{P_o}{P_n}\times 100$ (D) $\frac{P_n}{P_{n-1}}\times 100$

2. Two events A and B are called mutually exclusive if:

(A) (AUB)=ϕ (B) $(A\cap B)=\phi$ (C) $(A\cap B)=S$ (D) $(A\cap B)=1$

3. The collection of all possible outcome of a random experiment is called:

(A) Sample point (B) Sure event (C) Sample event (D) Simple event

4. If E(x)=4 and E(x^2)=20, then var(x) will be:

(A) 4 (B) 8 (C) 2 (D) 1

5. Probability density function of a_____random variable:

(A) Discrete (B) Qualitative (C) Continuous (D) None of these

6. Binomial distribution is negative skewed when:

(A) p=q (B) p<q (C) p>q (D) p=$\frac{1}{2}$

7. In binomial distribution n=20,p=$\frac{3}{5}$,then the variance of the distribution is:

(A) 4.8 (B) 12 (C) 48 (D) 4.5

8. The parameters of the hypergeometric distribution are:

(A) N,p,K (B) x,N,K (C) N,x,n (D) N,n,K

9. Counting or enumerations usually provide:

(A) continuous data (B) Qualitative data (C) Discrete data (D) Grouped data

10. Issuing a national identity card is an example of:

(A) census (B) sampling (C) registration (D) Investigation

11. The process of arranging data into rows and columns is called:

(A) Tabulation (B) Classification (C) Array (D) Histogram

12. Sum of absolute deviations of the values is least when deviations are taken from:

(A) Mean (B) Median (C) Mode (D) G.M

13. If a distribution has two modes then it is called:

(A) Tri-model (B) Uni-model (C) Multi-model (D) Bi-model

14. If the values of a variable are -2,-3,-5,-10,-6,-4 then the range is:

(A) -12 (B) -8 (C) -4 (D) 8

15. For a symmetrical distribution:

(A) $\beta_2=0$ (B) $\beta_2<3$ (C) $\beta_1=0$ (D) $\beta_1>3$

16. If S.D(x)=5 then S.D $\left(\frac{2x+5}{2}\right)$ is equal to:

(A) 5 (B) 10 (C) 15 (D) 7.5

17. The prices used in the construction of consumer price index numbers are:

(A) Fixed prices (B) The retail prices (C) The wholesale prices (D) None of these

Roll No._____to be filled in by the candidate.

Session;2014-2016

Statistics (Essay type)

Time: 3:10 Hours **Marks: 83**

SECTION-I

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define population and sample.
ii. Define Descriptive Statistics.
iii. Find mode from the given data:4,4,5,5,6,5,6,7,7.
iv. Define harmonic mean.
v. What is the base period?
vi. Define link relative.
vii. Define price index numbers.
viii. Write the formula for Fisher's price index number.
ix. For a certain distribution: $\sum(X-15)^2 = 868$, $\sum(X-16)^2 = 720$, $\sum(X-20)^2 = 982$ .What is the value of mean?And why?
x. Describe the empirical relation between mean,median and mode.
xi. If mode=25 and median=30, then find approximate value of mean.
xii. Given $\sum p_n q_n = 9000$,and $\sum p_o q_n = 8490$, find consumer price index number by aggregate expenditure method.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define class limits.
ii. Define relative frequency.
iii. Define relative Dispersion.
iv. Write down any two properties of standard deviation.
v. If for a set of data mean=36,SD=6,then find C.V.
vi. If for a set of data m_2=43.50 and m_3=17.33. Find moment ratio b_1.
vii. Define mutually exclusive events.
viii. What is "relative frequency" definition of probability?
ix. State general addition Law of probabilities.
x. Define conditional probability.
xi. Given that mean=50,median=48 and SD=6.Find coefficient of skewness.
xii. The second moment about mean is 13.76 and fourth moment about mean is 528.06.Find moment ratio b_2.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Define probability density function.
ii. Write properties of random variable.
iii. Find P(α =0) when N=3,n=2,k=1.
iv. Give two examples of random variables.
v. var(x)=4.Find var(4x+4).
vi. Give two properties of binomial distribution.
vii. Define binomial experiment.
viii. Write down the parameters of hypergeometric distribution.
ix. Write down mean and variance of random variable x in term of expectation.

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. **(a)** Given the following data.

Marks	30-39	40-49	50-59	60-69	70-79
f	3	10	20	13	4

Show that G.M is less than Arithmetic mean.

(b) Find the value of mode from the data:

Marks	10-14	15-19	20-24	25-29	30-34
f	2	4	8	6	3

6. **(a)** Calculate coefficient of variation and coefficient of S.D of the following data:

X	0	1	2	3	4
f	17	9	6	5	3

(b) Find first two moments about the mean of the following data.

X	22	27	32	37	42	47	52
f	1	4	8	11	5	9	2

7. (a) Given the following information.

$\sum p_1 q_0 = 41140$, $\sum p_0 q_0 = 35310$, $\sum p_1 q_1 = 46707$, $\sum p_0 q_1 = 40048$ .Compute:

(i) Base year weighted price index.

(ii) Current year weighted price index.

(b) An integer is chosen at random from the first 200 positive integers.What is the probability that the integer chosen is divisible by 6 or 8?

8. (a) Find E(x) and var(x) for the following probability distribution.

X	2	3	4	5	6
P(X)	0.01	0.25	0.40	0.30	0.04

(b) If f(x) has a probability density kx^2 ,0<x<1,determine its K and find the Probability that $\frac{1}{3} < x < \frac{1}{2}$

9. (a) If x is binomially distribution with n=10, p=0.4 then find the mean and variance of y= $\frac{x-10}{6}$.

(b) Three balls are drawn without replacement from a box containing 3 white and 7 red balls.If x denotes the number of white balls then obtain probability distribution of x.Also compute its $E(x^2)$.

Section -III (Practical)

NOTE: Answer any three parts from the following. **5x3=15**

10.A. A variable Y is determined from a variable X by the equation Y=10-5X.Find Y when X=-3,-2,-1,0,1,2,3,4,5 and show that $\overline{y} = 10 - 5\overline{x}$. **5**

B. Find the mean deviation from median. **5**

Daily wages	6	8	10	12	14	16	18	20
f	5	10	18	22	7	3	2	1

C. Compute chain indices taking 1920 as base for the following data. **5**

Years	1920	1921	1922	1923	1924	1925	1926
Prices	120	116	125	130	137	136	149

D. A fair die is rolled 5 times.Let X denotes the number of times the face 3 turns up.Obtain a probability distribution of X. **5**

E. Three balls are drawn from a bag containing 5 white and 3 black balls.Find the probability distribution of x if x is the number of white balls. **5**

☆

Roll No. ..... to be filled in by the candidate

(For all sessions)

Paper Code	6	1	8	1

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. A characteristic that does not vary from individual to individual is called:

(A) Variable **(B)** Constant **(C)** Continuous variable **(D)** Discrete random variable

2. A chart in which adjacent rectangles are used:

(A) Simple Bar Chart **(B)** Pie Chart **(C)** Histogram **(D)** Component Bar Chart

3. If in a certain data range=1000 and number of classes are 20 then class interval will be:

(A) 40 **(B)** 50 **(C)** 60 **(D)** 100

4. If $\bar{x} = 10$,and y=6+2x then $\bar{y}$ will be:

(A) 20 **(B)** 24 **(C)** 26 **(D)** 30

5. Which of the following is based on all values of a data set?

(A) Q_1 **(B)** Median **(C)** Mode **(D)** Geometric Mean

6. The geometric mean of 0,2,4 and 6 is:

(A) 2 **(B)** 0 **(C)** 4 **(D)** 6

7. Which of the following is a measure of dispersion?

(A) First quartile **(B)** 2nd quartile **(C)** Coefficient of Skewness **(D)** Range

8. The standard deviation is:

(A) The square of variance **(B)** Half of the variance

(C) Square root of the variance **(D)** Two times of the variance

9. The first moment about mean is equal to:

(A) 1 **(B)** 0 **(C)** Variance **(D)** Standard Deviation

10. $\frac{\sum p_n q_n}{\sum_{..} p_n q_n} \times 100$ is called:

(A) Paasche's index **(B)** Laspeyre's index **(C)** Fisher's index **(D)** Value index

11. Fisher's index number is_____of Laspeyre's and Paasche's index numbers:

(A) Arithmetic mean **(B)** Geometric mean **(C)** Harmonic mean **(D)** Median

12. The probability of obtaining an even number when a fair die is rolled:

(A) $\frac{1}{4}$ **(B)** $\frac{1}{3}$ **(C)** $\frac{1}{2}$ **(D)** 1

13. If A and B are two non-mutually exclusive events then P(AUB) be:

(A) P(A)+P(B) **(B)** P(A)P(B) **(C)** $P(A)+P(B)-P(A \cap B)$ **(D)** P(A/B)P(B)

14 Expected value of a random variable is equal to:

(A) Standard Deviation **(B)** Mean Deviation **(C)** Variance **(D)** Mean

15. For a random variable X if var(X)=4 then var(2X+4) will be:

(A) 12 **(B)** 16 **(C)** 20 **(D)** 32

16. For a bionomial distribution with parameters n and P,mean and variance are related as:

(A) Mean=Variance **(B)** Mean>Variance **(C)** Mean<Variance **(D)** Always coincide

17. In hypergeometric distribution with n=5, K=10 and N=20 the mean is:

(A) 2.5 **(B)** 10 **(C)** 40 **(D)** 3/4

Roll No._____ to be filled in by the candidate.

(For all sessions)

Statistics (Essay type)

Time: 2:40 Hours **SECTION-I** **Marks: 68**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Define statistics and data.
ii. What is population and sample?
iii. Write two merits of arithmetic mean.
iv. Define Median and give its formula.
v. Write two merits of median.
vi. What is Fisher's Index number?
vii. What are Deciles?
viii. What is composite index number?
ix. Define Value Index.
x. What is consumer price index number?
xi. Define Mean.What is formula for calculation of mean for group data?
xii. What are the types of weighted aggregative index number?

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What do you mean by TABULATION?
ii. If second moment about mean is 5,what is fourth moment for a mesokurtic distribution?
iii. Define the term DISPERSION.
iv. Define Mutually Exclusive Events.
v. Define HISTOGRAM.
vi. If Var(x)=16, then find the variance of 5x-100.
vii. Define moments.
viii. Define Mean Deviation.
ix. Define Conditional Probability.
x. What is the probability of a Red card in a pack of 52 cards?
xi. C_r^n =_____, P_x^m =_____.
xii. State Multiplicative Law of probability for dependent events.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. Define Random Variable.
ii. Describe two properties of discrete probability distribution.
iii. What is mean and variance of bionomial distribution with parameters n and p?
iv. Write down any two properties of Expectation.
v. If E(x)=0.63, var(x)=0.2331 then find $E(x^2)$.
vi. Define bionomial experiment.
vii. Define probability density function(p.d.f).
viii. Define Hypergeometric probability distribution.
ix. In hypergeometric distribution N=7,n=5 and K=2 Find P(x=0).

SECTION-II

Note: Attempt any three questions from the following. **8x3=24**

5. (a) For the following frequency distribution if D=x-18,Find GM. **4**

D	-12	-8	-4	0	4
f	2	5	8	18	22

(b) A bus traveling 200 miles has 10 stages at equal intervals.The speed of bus at various stages was observed to be 10,15,20,75,20,30,40,50,30 and 40 miles per hour.Find average speed at which the bus has traveled. **4**

6. (a) Calculate co-efficient of variation from the following frequency distribution. **4**

X	0	1	2	3	4
f	17	9	6	5	3

(b) First four moments of a distribution about x=2 are 1,2.5,5.5 and 16.Calculate mean and Co-efficient of variation. **4**

7. (a) The following data gives prices and quantities of four commodities for the years 2000 and 2002.Find Paasche's index. **4**

Commodity	Prices		Quantities	
	2000	2002	2000	2002
A	70	75	300	310
B	72	80	240	275
C	25	32	132	148
D	60	85	280	360

(b) If the probability of a horse A winning a race is 1/5 and that of a horse B is 1/6.What is the probability that one of them wins? **4**

8. (a) The probability distribution of a random variable x is given as. **4**

x	0	1	2	3
P(x)	0.1	0.2	0.3	0.4

Show that E(5x+8)=5E(x)+8

(b) For a continuous random variable X,Probability density function is: **4**

f(x)=cx $0 \le x \le 2$. Find **(i)** value of c **(ii)** $P(\frac{1}{2} \le x \le \frac{3}{2})$

9. (a) A fair coin is tossed four times.Find the probability that there will appear. **4**

(i) Atleast 2 heads. **(ii)** Atmost 2 heads.

(b) In hypergeometric distribution determine the following **4**

(i) n=4, N=10, K=3, Find P(x=2) **(ii)** n=7, N=12, K=8, Find P(x=6)

7. **(a)** Given the following information.

$\sum p_1 q_0 = 41140$, $\sum p_0 q_0 = 35310$, $\sum p_1 q_1 = 46707$, $\sum p_0 q_1 = 40048$ .Compute:

(i) Base year weighted price index. **(ii)** Current year weighted price index.

(b) An integer is chosen at random from the first 200 positive integers.What is the probability that the integer chosen is divisible by 6 or 8?

8. **(a)** Find E(x) and var(x) for the following probability distribution.

X	2	3	4	5	6
P(X)	0.01	0.25	0.40	0.30	0.04

(b) If f(x) has a probability density kx^2 ,0<x<1,determine its K and find the Probability that $\frac{1}{3} < x < \frac{1}{2}$

9. **(a)** If x is binomially distribution with n=10, p=0.4 then find the mean and variance of y= $\frac{x-10}{6}$.

(b) Three balls are drawn without replacement from a box containing 3 white and 7 red balls.If x denotes the number of white balls then obtain probability distribution of x.Also compute its $E(x^2)$.

Section -III (Practical)

NOTE: Answer any three parts from the following. **5x3=15**

10.A. A variable Y is determined from a variable X by the equation Y=10-5X.Find Y when X=-3,-2,-1,0,1,2,3,4,5 and show that $\overline{y} = 10 - 5\overline{x}$. **5**

B. Find the mean deviation from median. **5**

Daily wages	6	8	10	12	14	16	18	20
f	5	10	18	22	7	3	2	1

C. Compute chain indices taking 1920 as base for the following data. **5**

Years	1920	1921	1922	1923	1924	1925	1926
Prices	120	116	125	130	137	136	149

D. A fair die is rolled 5 times.Let X denotes the number of times the face 3 turns up.Obtain a probability distribution of X. **5**

E. Three balls are drawn from a bag containing 5 white and 3 black balls.Find the probability distribution of x if x is the number of white balls. **5**

Roll No._____ to be filled in by the candidate

(For all sessions)

Paper Code	6	1	8	1

Statistics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given.Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. A specific characteristic of a population is called:

(A) Statistic **(B)** Variable **(C)** parameter **(D)** Sample

2. The number of observations falling in a class is called:

(A) Class Mark **(B)** Class Frequency **(C)** Class Interval **(D)** None of these

3. The observation which occurs maximum number of times in a data is called:

(A) Mean **(B)** Mode **(C)** Median **(D)** Harmonic Mean

4. Geometric mean of the values 2,4,8 is:

(A) Zero **(B)** 6 **(C)** 4 **(D)** 16

5. Mean is greatly affected by:

(A) Two values **(B)** Extra values **(C)** Minor values **(D)** Extreme values

6. The range of the values -2,-4,-6,-8 is:

(A) -6 **(B)** -10 **(C)** 6 **(D)** -4

7. Mean of absolute deviations from an average is called:

(A) Arithmetic mean **(B)** Deviation from average

(C) Deviation from mean **(D)** Mean deviation

8. If sum of squared deviations from mean is 64 for 16 observations,then standard deviation is:

(A) 2 **(B)** 4 **(C)** 16 **(D)** None of these

9. If all the commodities are not of equal importance in an index number,the index is called:

(A) Weighted **(B)** Simple **(C)** Unweighted **(D)** None of these

10. For computing chain index numbers,we compute:

(A) Price relatives **(B)** Weighted indices **(C)** Link relatives **(D)** Value relatives

11. The events A and B are mutually exclusive if:

(A) $A \cap B = \phi$ **(B)** $A \cap B = 0$ **(C)** $A \cup B = 0$ **(D)** $A \cup B = \phi$

12. The probability of drawing an ace card from a pack of 52 playing cards is:

(A) $4/52$ **(B)** $1/4$ **(C)** $1/52$ **(D)** $1/26$

13. A random variable may be either discrete or:

(A) Experiment **(B)** Discontinuous **(C)** Continuous **(D)** Fixed

14. Probability function can never be:

(A) zero **(B)** positive **(C)** less than 1 **(D)** negative

15. In a binomial experiment,the trials are:

(A) constant **(B)** independent **(C)** Dependent **(D)** None of these

16. Mean of hypergeometric distributions is:

(A) $\frac{nk}{N}$ **(B)** $\frac{NK}{n}$ **(C)** $\frac{nN}{K}$ **(D)** $\frac{n}{NK}$

17. In a binomial distribution$(q+p)^4$, the variance is:

(A) pq **(B)** 4pq **(C)** 4+p+q **(D)** 2p+q

Roll No._____ to be filled in by the candidate.

(For all sessions)

Statistics (Essay type)

Time: 2:40 Hours **SECTION-I** **Marks: 68**

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Differentiate between Qualitative and Quantitative variables.
ii. How would you define current year weighted index number?
iii. If $\sum p_n q_n = 120$, $\sum p_o q_o = 100$, $\sum p_o q_n = 130$. Find base year weighted index number.
iv. Differenciate between raw data and secondary data.
v. Enlist the different types of average.
vi. Write down the steps in construction of index numbers.
vii. Write down the merits of Mode.
viii. Define Weighted Mean.
ix. Find Harmonic Mean for 5,10 and 50.
x. If Mode=25,median=15,Find Arithmatic Mean.
xi. Define Quantiles.
xii. What are the names of weighted index numbers.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. What is meant by tabulation?
ii. Define Class Limits.
iii. What do you understand by dispersion?
iv. If Q1=88.03, Q_3 =94.50 find Quartile deviation.
v. Write any four properties of variance.
vi. Explain the Skewness.
vii. Define standard deviation.
viii. If Var(x)=10 and y=5x+20 then find var(y).
ix. Define the term combination.
x. State addition law of probability for mutually exclusive events.
xi. What are equally likely events?
xii. What is meant by sample space?

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. What should be the sum of probabilites for all possible values of a random variables?
ii. How many parameters are there in binomial distribution?
iii. In a binomial distribution, $p=\frac{3}{5}$ and n=20, find mean of this distribution.
iv. Given that n=5,N=11,k=4 find mean of hypergeometric distribution.
v. Given that:

x	1	2
P(X=x)	9/15	6/15

,Find E(X).

vi. For the given probability distribution:

x	0	1	2
P(X=x)	4/10	5/10	m

Find m.

ix. In Hypergeometric distribution,which type of sampling is used?
vii. Describe the properties of binomial experiment.
viii. Find E(X-Y), if E(X)=3 and E(Y)=2

SECTION-II **24**

Note: Attempt any three questions from the following. **8x3=24**

5. (a) Calculate lower (Q_1) and upper(Q_3) quartiles of the following data. **4**
84.60, 88.03, 94.50, 94.90, 95.05.

(b) The table shows the distribution of maximum loads in shot tons supported by certain cables produced by a company. **4**

Max. Loads	9.3-9.7	9.8-10.2	10.3-10.7	10.8-11.2
No. of cables	2	5	12	17

Determine Mode.

6. (a) Calculate mean deviation (about mean) for distribution given below. **4**

Weights(Kg)	50-53	53-56	56-59	59-62	62-65
No. of students	23	24	39	46	54

Also find coefficient of mean deviation(from mean).

(b) Calculate standard deviation by using arithmetic mean for the data given below. **4**
3,5,7,13,15,17,23,27

7. (a) Find the index number of price from the following data taking average price of all years as the base. **4**

Years	1970	1971	1972	1973	1974	1975	1976	1977
Prices	15	19	21	30	37	38	40	48

(b) Six white balls and four black balls which indistinguishable apart from colour,are placed in a bag.If six balls are taken from the bag.Find the probability,there being three white and three black. **4**

8. (a) The number of automobile accidents in a city are: 1,2,3,4 with corresponding probabilities: 1/8, 2/8, 2/8, 3/8.What is the expected number of daily accidents? **4**

(b) The probability distribution of a discrete random variable 'X' is given by: **4**

$$f(x)=\binom{3}{x}\left(\frac{1}{4}\right)^{x}\left(\frac{3}{4}\right)^{3-x}$$ for x=0,1,2,3. find **(i)** E(x) **(ii)** Var(x)

9. (a) A fair coin is tossed 5 times.What is the probability of getting: **4**
(i) Exactly three heads **(ii)** At least three heads

(b) Given that X is the hypergeometric random variable with N=8, n=3 and K=5.Compute $P(x \leq 2)$ **4**