D   (Printed Pages 4)

(21223)   Roll No. ....

B.C.A. - III Sem.

18015

B.C.A. Examination, Dec.-2023

Elements of Statistics

(BCA-305)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from **All** sections as per Instructions.

Section - A

Note : Attempt **all** five questions.   3×5=15

1. What is statistics? Discuss its uses.

2. What is meant by central tendency? Describe the various measures of it.

3. Define coefficient of variation.

4. Define mutually exclusive events and independent events.

5. What do you understand by Statistical Quality control.

P.T.O.

Section - B

Note : Attempt any **two** questions.

7.5×2=15

6. The mean age of a group of 100 children was 9.35 years. The mean age of 65 of them was 10.51 years. What was the mean age of the remaining children?

7. Define dispersion. Calculate the standard deviation of the following distribution :

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	5	10	15	12	4

8. Explain how $\bar{X}$ and R charts are drawn in practice. How would you interpret the points falling outside the control limits on these charts?

Section - C

(Long Answer Type Questions)

Note : Attempt any **three** questions.

15×3=45

18015/2

9. (a) Find the mode from the the following frequency distribution :

Class-interval	0-9	10-19	20-29	30-39	40-49	50-59
Frequency	4	13	30	15	10	5

(b) Define classification. Discuss the types of classification with their examples.

10. (a) Give mathematical definition of probability.

(b) A bag contains 6 green, 7 blue and 2 red balls, 3 balls are drawn from it. Find the probability that one green, one blue and one red ball is drawn.

11. Write down the definition merits and demerits of Arithmetic mean, median and mode.

12. (a) Explain additive law of probability by giving suitable examples.

(b) Three coins are tossed simultaneously. Find the probability of getting :

(i) Two heads

(ii) at least one head.

13. Distinguish between defect and defective. Give some examples of defects for which the C-chart is applicable. How do you calculated control limits for a c-chart? Discuss the assumptions and approximations involved in the calculations.

P.T.O.

A   (Printed Pages 4)

(21222)   Roll No. ....

B.C.A.-III Sem.

18015
B.C.A. Examination, Dec.-2022
Elements of Statistics
(BCA-305)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from **all** sections

as per Instructions.

Section-A

Note : Attempt **all** five question.   3×5=15

1. Differentiate between.

    (i) Population and Sample

    (ii) Attributes and Variables.

2. Define harmonic and geometric means.

3. What is coefficient of variation? Discuss

    the situation where it is used.

    P.T.O.

4. Define the following.

    (i) Random experiment

    (ii) Mutually exclusive events

    (iii) Independent events

5. Discuss process and product control.

Section-B

Note : Attempt any **two** questions.

7½×2=15

6. Describe various measure of dispersion

    with their applications.

7. In a college 50% of science students

    are girls, while 25% of the girls are

    science students. If 40% of the students

    in the college are girls, what are the

    probabilities that a randomly selected

    student from the college :

    (i) is a boy and reads science

    (ii) is a boy when it is given that the

    student is not a science student.

/2

8. Obtain median and mode of the following data:

Class interval	Frequency
0-10	8
10-20	12
20-30	21
30-40	17
40-50	21
50-60	9
60-70	8

Section-C

Note : Attempt any **three** questions.

$$15 \times 3 = 45$$

9. Explain the main control charts for attributes and obtain their control limits. Discuss the advantages and dis advantages of control chart of variable and attributes.

10. Define permutation and combination. In how many ways can 8 people be seated in a row if :
   (i) there are no restrictions on the seating arrangement.
   (ii) there are 4 men and 4 women and not 2 men or 2 women can sit next to each other.
   (iii) there are five men and they must sit next to each other.

11. Define frequency distribution, frequency curve, frequency polygon and ogive. Draw 'less' than' and 'more than' ogives for the following data and hence find the median.

Class interval	Frequency
0-5	2
5-10	6
10-15	7
15-20	5
20-25	12
25-30	10
30-35	8
35-40	14

12. What do you mean by classification and tabulation? Explain the purpose of classification and tabulation of data.

13. Write short notes on the following :
   (i) Control charts for $\overline{X}$ and R
   (ii) Specification limits and tolerance limits
   (iii) Applications of statistics in different fields.

18015/3

P.T.O.

18015/4

A (Printed Pages 4)

(20222)　　　Roll No. ....

B.C.A.-III Sem.

18015(CV-III)

B.C.A. Examination, Dec.-2021

ELEMENTS OF STATISTICS

(BCA-305)

Time : 1½ Hours]　　　[Maximum Marks : 75

Note : Attempt questions from **all** sections as per instructions.

Section-A

(Very Short Answer Questions)

Note : Attempt any **two** questions. Each question carries 7.5 marks. Very Short Answer is required not exceeding 75 words.　　　$2 \times 7.5 = 15$

1. Define Discrete and continuous variables.

2. Discuss in brief geometric mean along with its merits and demerits.

3. Define partition values? What purpose do partition values serve?

P.T.O.

4. State addition theorem of probability for three events.

5. Distinguish between defects and defectives.

Section-B

(Short Answer Questions)

Note : Answer any **one** question out of the following three questions. Each question carry 15 marks. Short answer is required not exceeding 200 words.　　　$1 \times 15 = 15$

6. What is statistical average or central tendency? Discuss the uses of all measure of central tendency.

7. What is dispersion/Variability? Explain various methods of measuring dispersion along with their merits and demerits?

8. Define combinations and permutations. How many baseball teams are possible of nine members among twelve boys, without regard to the position played by each member?

Section-C

(Detailed Answer Questions)

Note : Attempt any **two** questions out of

18015(CV-III)/2

the following five questions. Each question carry 22.5 marks. Answer is required in detail. $2 \times 22.5 = 45$

9. Find the mean, median and mode wage of the following distribution.

Wages (in Rs.)	No. of labourers
20-30	3
30-40	5
40-50	20
50-60	10
60-70	5

10. A consumer affairs agency wants to check the average weight and standard deviation in weight of a new product on the Market. The weights (in grams) of these items are as follows:

Class limits	Frequency
74-77	3
77-80	6
80-83	9
83-86	3
86-89	4

11. (i) Define Mutually exclusive events and Independent events.

(ii) From a group of 3 Indians, 4 Pakistanis, and 5 Americans a subcommittee of four people is selected at random. Find the probability that the sub-committee will consist of

(a) 2 Indians and 2 Pakistanis

(b) 1 Indian, 1 Pakistani and 2 Americans

12. (i) Define Classical Definition of Probability? What are its limitations?

(ii) A can hit a target 3 times in 5 shots, B 2 times in 5 shots, and C 3 times in 4 shots. They fire a volley. What is the probability of hitting 2 shots?

13. Distinguish between process control and product control. Explain the construction and operation of control chart for number of defective.

D

(20221)

(Printed Pages 4)

Roll No. ....

B.C.A.-III Sem.

18015

B.C.A. Examination, Dec.-2020

ELEMENTS OF STATISTICS

(BCA-305)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from **all** the sections as per instructions.

Section-A

(Very Short Answer Questions)

Note : Attempt all **five** questions. $3 \times 5 = 15$

1. Define the following :
   (i) Frequency curve and frequency Polygon.
   (ii) Assignable and random causes.
   (iii) Equally likely and mutually exclusive events.

2. An average rainfall of a city from Monday to saturday is 0.3 inch. Due to heavy rainfall on sunday, the average rainfall for the week increased to 0.5 inch. What was the rainfall on Sunday?

P.T.O.

3. (I) In how many ways can 3 boys and 3 girls sit in a row if the boys and the girls are each to sit together?
   (II) In how many ways can 3 boys and 3 girls sit in a row if only the boys must sit together?

4. Explain the terms :
   (I) Control limits.
   (II) Tolerance limits.
   (III) Specification limits.

5. Differentiate between variance and coefficient of variation.

Section-B

(Short Answer Questions)

Note : Attempt any **two** questions.

$7\frac{1}{2} \times 2 = 15$

6. Define probability. Suppose that A and B are mutually exclusive events for which $P(A) = 0.3$ and $P(B) = 0.5$. What is the probability that (a) either A or B occurs (b) A occurs but B does not (c) both A and B occur.

7. Explain the construction and interpretation of mean chart and range chart.

18015/2

8. What is median? Calculate median of the following data :

Class Interval	Frequency
15-25	4
25-35	11
35-45	19
45-55	14
55-65	0
65-75	2

Section-C
(Detailed Answer Questions)

Note : Attempt any three questions.

$15 \times 3 = 45$

9. (a) Explain and illustrate the uses of statistics in commerce and business.

   (b) Discuss the steps involved in tabulation and classification of data.

10. What is dispersion? Explain mean deviation, standard deviation and Range with their uses. https://www.ccsustudy.com

11. Describe arithmetic, harmonic and geometric means for grouped and ungrouped data with their limitations.

18015/3

P.T.O.

12. Define process and product control. Discuss the charts for proportion of defectives and number of defects. Obtain control limits of a suitable chart to be used for the following problem.

A survey is conducted to observe defects on TV set from 10 samples (sample size=10) and the results are given below:

Sample No.	No. of defects
1	5
2	4
3	5
4	6
5	4
6	4
7	5
8	6
9	7
10	8

Does any sample show out of control signal?

13. Write short notes on the following :

   (a) Statistical Quality Control.

   (b) Absolute and relative measure of dispersion.

   (c) Frequency distribution and cummulative frequency distribution.

18015/4

A

(21119)

Printed Pages : 4

Roll No. ....

B.C.A.-III Sem.

18015

B.C.A. Examination, November-2019

ELEMENTS OF STATISTICS

(BCA-305)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from *all* sections as per instructions.

Section–A

(Very Short Answer Questions)

Note : Attempt all *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words.   5×3=15

1. Define population and sample with examples.

2. What are the good measures of central tendency? Also define mean for grouped and ungrouped data.

3. What is statistical quality control ? Differentiate between process and product control.

18015   **[P.T.O.**

4. What is classical definition of probability ? What is the probability of getting a sum 7 of the face values when two fair dice are thrown simultaneously ?

5. Define coefficient of variation.

Section–B

(Short Answer Questions)

Note: Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words.   2×7½=15

6. Discuss various measures of dispersion with their merits and demerits.

7. Differentiate between defects and defective. Discuss p-chart and c-chart in detail.

8. Define permutations and combinations. A class in probability theory consists of 6 men and 4 women. An-examination is given and the students are ranked according to their performance. Assume that no two students obtain the same score.

   (a) How many different rankings are possible ?

18015

(b) If the men are ranked just among themselves and the women among themselves, how many different rankings are possible

Section-C
(Detailed Answer Questions)

Note : Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. $3 \times 15 = 45$

9. What do you mean by classification and tabulation ? Discuss their importance.

10. Define median and quantiles. Explain their uses. Calculate first and third quartiles of the following data :

Wages (in Rs.) :	60-70	50-60	40-50	30-40	20-30
No. of laboures :	5	10	20	5	3

11. Discuss additive theorem of probability. A ball is drawn at random from a box containing 6 red balls, 4 white balls and 5 blue balls. Determine the probability that it is :

(i) Red   (ii) White   (iii) Blue

(iv) Not Red   (v) Red or White

18015   [P.T.O.

12. Calculate mean deviation and standard deviation from the following data :

Marks	:	10	20	30	40	50	60
No. of Students	:	8	12	20	10	7	3

13. Discuss $\bar{X}$ and R charts with their applications in real life. Mean values and ranges of data from 5 samples (sample size = 4) are shown below :

S. No. :	1	2	3	4	5	6	7	8	9	10	11
Mean :	10	15	12	11	9	11	11	9	10	11	12
Range :	4	4	5	4	5	6	4	4	4	6	5

S. No. :	12	13	14	15
Mean :	13	12	12	11
Range :	4	4	3	3

Construct $\bar{X}$ and R charts for the above data and explain the results.

18015

G

(21218)   Roll No. ....

B.C.A.-III Sem.

18015

B. C. A. Examination, Dec. 2018

Elements of Statistics

(BCA-305)

(New Course)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks.   3×5=15

1. Define the following terms :

   (i)   Union and intersections of events

   (ii) Mutually exclusive and independent events

   (iii) Specification limits and tolerance limits.

2. Define frequency polygon and frequency curve.

3. What do you mean by process and product control ?

4. A coin is tossed three times with probability of head 1/4 and probability of tail 3/4. Obtain probability of getting at least one head.

5. Define permutation and combination.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks.   7½×2=15

6. Discuss the various measures of central tendency with their limitations.

7. What is meant by statistical quality control ? Discuss $\bar{X}$ and R charts with their applications in industry.

8. Calculate quartile deviation of the following data :

Class Interval	Frequency
0 – 10	14
10 – 20	10
20 – 30	8
30 – 40	6
40 – 50	9
50 – 60	5
60 – 70	3
70 – 80	2

18015

Section-C
(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. $15 \times 3 = 45$

9. Explain the use of *p*-chart and c-chart. A bicycle manufacturer randomly selects 10 frames each day and tests for defects. The number of defective frames found over the last 14 days is 3, 2, 1, 3, 2, 2, 8, 2, 0, 3, 5, 2, 0, 4. Construct a control chart for this process and comment on whether the process is 'in control'.

10. (a) A box contains 4 chocobars and 4 icecreams. Tom eats 3 of them by randomly choosing. What is the probability that he eat 2 chocobars and 1 ice cream ?

 (b) In a class, 40% of the students study Math and Science. 60% of the students study Math. What is the probability that a student studying Science given that he/she is already studying Math ?

11. Discuss the various types of classification and tabulation of data in detail.

12. What is Statistics ? Discuss the uses of statistics in different fields.

13. Write short notes on the following :

 (i) Measure of dispersion

 (ii) Three sigma control limits and its uses

 (iii) Relative measure of dispersion.

N

(Printed Pages 4)

(201217)   Roll No. ....

B.C.A.- III Sem.

18015

B.C.A. Examination, Dec- 2017

Elements of Statistics

(BCA-305)

(New Course)

Time : Three Hours]   *[Maximum Marks : 75*

Note : Attempt questions from **all** sections as per Instructions.

Section-A

(Very Short Answer Questions)

Note : Attempt all the **five** questions. Each question carries 3 marks. $3 \times 5 = 15$

1. What do you mean by permutation and combination. Explain with examples.

2. Differentiate between the concepts of population and sample.

3. What is the criteria of good measure of central tendency?

P.T.O.

4. Explain the concept of sample space with some examples.

5. Differentiate between process and product control.

Section-B

(Short Answer Questions)

Note : Attempt any **two** questions. Each question carries 7.5 marks. $7.5 \times 2 = 15$

6. What do you mean by classification? Explain various types of classifications with examples.

7. Define arithmetic mean and median. State their merits and demerits. The mean age of a class of 100 students is 16.2 years. The mean age of girls is 15 years and that of boys is 17 years. Calculate the number of girls and boys in the class.

8. Define (i) Exhaustive events (ii) Mutually exclusive events and (iii) Independent events with examples. A bag contains 6 green, 7 blue and 2 red balls. 3 balls are drawn from it. Find the probability that one green, one blue and one red ball is drawn.

18015\2

Section-C

(Detailed Answer Questions)

Note : Attempt any **three** questions. Each question carries 15 marks. $15 \times 3 = 45$

9. Define mode by giving it merits and demerits. Give the steps for its calculation. Find the mode of the following frequency distribution. ,

Size (x)	1	2	3	4	5	6	7	8	9	10	11	12
Frequency (f)	3	8	15	23	35	40	32	28	20	45	14	6

10. What do you mean by measure of dispersion? Name various measures of dispersions. For the following data, find the standard, deviation and the coefficient of variation.

Marks	No. of Students	Marks	No. of Students
0-10	5	40-50	30
10-20	10	50-60	20
20-30	20	60-70	10
30-40	40	70-80	4

18015\3

P.T.O.

11. Define Ogive. Compute the less than and more than ogives and calculate the value of median by graphs for the following frequency distribution.

Marks	No. of Students	Marks	No. of Students
0-10	04	40-50	12
10-20	08	50-60	06
20-30	11	60-70	05
30-40	15	70-80	02

12. Differentiate between the following with examples-

    (i) Deterministic and non-deterministic experiments.

    (ii) Mathematical and statistical definitions of probability.

    (iii) Union and intersection of two or more events.

13. Differentiate between defects and defective. Discuss the control charts for

    (i) Mean ($\bar{X}$)

    (ii) Range (R)

    (iii) Proportion defective (p) and

    (iv) No, of defects (C)

18015\4

N

(21216)

Roll No ....

B.C.A.- III Sem.

18015

B. C. A. Examination, Dec. 2016

Elements of Statistics

(BCA-305)

(New Course)

Time : Three Hours]   [Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Answer all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words.   3×5=15

1. What is meant by classification ? Discuss with example.

2. Differentiate between absolute and relative measure of dispersion.

3. Define chance and assignable causes.

4. Define (i) equally likely events (ii) mutually exclusive events (iii) independent events.

5. Differentiate between specification and tolerance limits.

Section-B

(Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. Discuss the various measures of central tendency with their merits and demerits.

7. Define the classical definition of probability with its limitations. A salesman has a 60% chance of making a sale to any one customer. The behaviour of successive customers is independent. If two customers A and B enter, what is the probability that the salesman will make a sale to A or B.

8. Define statistical quality control. Discuss control charts for $\overline{X}$ and R in detail.

Section-C

(Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail.   15×3=45

18015

9. Define dispersion. Calculate standard deviation of the following data :

Class interval	Frequency
5 – 10	6
10 – 15	5
15 – 20	15
20 – 25	10
25 – 30	5
30 – 35	4
35 – 40	3
40 – 45	2

10. Calculate median and mode from the following data :

Salary per day	No. of persons
1 – 5	7
5 – 10	10
10 – 15	16
15 – 20	32
20 – 25	24
25 – 30	18
30 – 35	10
35 – 40	5

11. Define permutations and combinations. A committee of 4 people is to be appointed from 4 officers of the production department, 3 officers of the purchase department, 3 officers of the sales department, and two chartered accountants. How many ways this committee can be formed :
    (i) by selecting one person from each category
    (ii) by selecting two from production department and one person from each purchase and sales department ?

12. Define control chart for number of defectives. In the manufacture of certain tanks the following data were observed :

Sample No.	Size	No. of Defectives
1	200	20
2	200	19
3	225	23
4	75	8
5	190	18
6	210	22
7	500	51
8	212	21

Draw the control chart for number of defective.

13. Discuss the various definitions of statistics. Describe the important uses and limitations of statistics.