PARUL UNIVERSITY
COLLEGE OF AGRICULTURE
B.Sc.(Hons.) Summer 2021 - 22 Examination

Semester : 3   Date: 28/03/2022
Subject Code: 20111202   Time:2:00pm to 4:30pm
Subject Name: Statistical Methods   Total Marks: 50

Instructions
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed.

A. Fill in the blanks. (Each of 0.5 mark)   (05)

1. For the following row data 1,3,2,4,2,5,2,5,6 ,5,5,2,6 the mode is _____.

2. The number of elements in sample space for rolling a dice for 2 times is _____.

3. If $P(\bar{A}) = 0.56$, then $P(A) =$ _____.

4. In standard notation, if $M = 8, \bar{x} = 10$ then $Z =$_____.

5. The formula of median for grouped data is _____.

6. The degree of freedom of correlation coefficient is _____.

7. For 4×7 contigency table, the degree of freedom is _____.

8. For the following frequency distribution

Marks	$0-4$	$4-8$	$8-12$	$12-16$
Frequency	4	8	5	6

   'Only 10 students have scored more than 8 marks' (TRUE/FALSE)

9. If $F_{cal} > F_{tab}$ then null hypothesis H_0 is_____ for F-test. (Rejected / accepted)

10. If in two way ANOVA, consider RSS=780, CSS=690 and TSS =1550,then ESS=_____.

B. Multiple choice type questions. (Each of 0.5 mark)   (10)

1. The binomial distribution is given by

   a) $_x^n C p^x q^{(n-x)}$ c) $_n^x C p^x q^{(n-x)}$

   b) $_x^n C p^x q^{(nx)}$ d) $_x^n C p^x q^{(n+x)}$

2. If $P(A) = 0.25$, $P(B) = 0.35$ and $P(A \cap B) = 0.15$ then $P(A \cup B) =$_____

   a) 0.6   c) 0.25

   b) 0.45   d) 1

3. To calculate _____add up all the numbers, then divide by how many numbers there are.

   a) Mean   c) Range

   b) Mode   d) Median

4. For the following row data 2,5,2,6,7,8,1 the median is _____.

   a) 2   c) 5

   b) 8   d) 6

5. If standard deviation of a data is 100 then the variance of that data is _____.

   a) 50   c) 2

   b) 10000   d) 10

6 The probability of getting odd number on a dice _____.

   a) 0.5   c) 0.3

   b) 0.2   d) 1

7 A cards are drawn from a pack of well shuffled playing cards,then the probability of getting a king is

_____.

   a) $\frac{2}{52}$ c) $\frac{4}{52}$

   b) $\frac{1}{52}$ d) $\frac{3}{52}$

8 The value of correlation coefficient lies between _____.

   a) -1 and 1   c) $-\infty$ and ∞

   b) 0 and 1   d) -1 and 0

9 The average height of 20 students in a class was calculated as 150 cm. On verification it was found

that one reading was wrongly recorded as 140 cm instead of 160 cm. The correct mean height is

_____.

   a) 160   c) 151

   b) 152   d) 140

10 Which of the following is true?

   a) Sample is a subset of a population.   c) Population is a subset of a sample.

   b) The mean of first 5 whole numbers is 1.   d) Mode $= 3$mean $+ 2$median.

11 The value of mean and variance are equal in _____ distribution

   a) Binomial   c) Exponential

   b) Poisson   d) Normal

12 If in one way ANOVA, consider degree of freedom for samples is 8 and total degree of freedom is 17

then degree of freedom for error is _____.

   a) 9   c) 15

   b) 6   d) 90

13 _____ is an analysis tool used in statistics that looks for significant differences of

means,for two or more samples.

   a) Hypothesis testing   c) Sampling

   b) ANOVA   d) Random variable

14 Probability of getting a black color card from a deck of well shuffled card is _____.

   a) $\frac{2}{3}$ c) $\frac{1}{3}$

   b) $\frac{1}{2}$ d) $\frac{1}{4}$

15 The probability of impossible event is _____.

   a) 3   c) 1

   b) 2   d) 0

16 The mean of first 5 prime numbers is _____.

   a) 5.6   c) 4.6

   b) 3.6   d) 6.6

17 If $\sigma = 4$ and $\bar{x} = 8$ then the value of coefficient of variation is?

    a) 40%   c) 90%

    b) 50%   d) 200%

18 If $b_{xy} = 0.08$ and $b_{yx} = 2$ then the value of correlation coefficient r is

    a) 0.4   c) 2.08

    b) 0.16   d) 1.92

19 Which of the following is not true for Binomial distribution?

    a) The number of trials are infinite.   c) The trails are independent of each other.

    b) There are only two possible outcomes.   d) The probability of success is constant for each trail.

20 If $t_{cal} < t_{tab}$ then null hypothesis H_0 is _____.

    a) accepted   c) rejected

    b) no conclusion   d) none of the above

Q.2 Do as Directed.

A. Define the following. (Any five out of seven) (05)

1. Write the formula of mode for grouped data.

2. 'Lesser the value of coefficient of variation then more consistent is the data.' (TRUE /FALSE)

3. _____ is the aggregate of all possible units.

4. Write the sample space when a coin is tossed for three times.

5. For the following raw data 1,1,1,2,2,2,3,3,3,3,1,2 ,3 the mode is _____.

6. Write the empirical formula of statistics .

7. Name any two types of graphical representation of statistical data.

B. Answer the following. (Any five out of seven) (05)

1. The variance for 2,2,2,2,2,2 is _____.

2. Scatter diagram is also a way to find the correlation between two variables. (TRUE/FALSE)

3. A hypothesis complementary to the null hypothesis is known as_____ hypothesis.

4. If $P(A) = 0.5$, $P(B) = 0.3$ and $P(A \cup B) = 0.2$ then find $P(A \cap B)$.

5. A cards are drawn from a pack of well shuffled playing cards, then the probability of getting a queen of heart is _____.

6. For the following raw data 20,15,10,40,30 the median is _____.

7. Consider the given data, if mean is 4 , median is 6, then the value of mode is ?

Q.3 Write short notes. (Any five out of six) (10)

1. State addition and multiplication theorem of probability.

2. Define Binomial and Poisson distributions.

3. Discuss two sample tests for Mean.

4. Discuss Chi-square test and Fisher's t-test.

5. Define Mean and median.

6. Define skewness and kurtosis.

Q.4 Long Questions/Example (Attempt any three out of four) (15)

1. Find the Karl Pearson's Correlation Coefficient of the following data:

x	100	101	102	102	100	99	97	98	96	95
y	98	99	99	97	95	92	95	94	90	91

2. Find the mean, median and mode from the following table:

Class	0-15	15-30	30-45	45-60	60-75	75-90	90-105
Frequency	2	5	12	17	8	3	3

3. The sale and expenditure of 10 companies are given below. Find the coefficient of correlation between sale and expenditure.

Sale	50	55	55	60	65	65	65	60	60	50
Expenditure	11	13	14	16	16	15	15	14	13	13

4. Find the missing values in the following one way ANOVA table

Source	SS	DF	MSS	F_c
Sample	50	β	μ	
Error	α	4	δ	ω
Total	80	12		

   (i)   Find the value of α.

   (ii)   Find the value of β.

   (iii)   Find the value of μ.

   (iv)   Find the value of δ.

   (v)   Find the value of ω.