Seat No:_____ **Enrollment No:_____**

PARUL UNIVERSITY
COLLEGE OF AGRICULTURE
B.Sc.(Hons.) Agriculture Summer 2018 - 19 Examination

Semester: 3 **Date:27/04/2019**
Subject Code: 20111202 **Time:10:30am to 01:00pm**
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. The median for the data $x = \{1,4,5,6,7\}$ is _____
2. If $b_{xy} = -1.4$ and $b_{yx} = 0.9$, then it is _____ (true or false)
3. If two coins are tossed, then the sample space is S = ____
4. If $n(A) = 6$ and $n(S) = 12$, then find $P(A) =$ ___
5. The constant obtained from sample is called ___
6. For 5% significance level and degrees of freedom = 3, then $t_{tab} =$___ (for one tail)
7. _____ type of error occurs in sampling.
8. ___ is the aggregate of all possible units.
9. The observation occurring most frequently is known as ____.
10. The probability that the sun will rise tomorrow is ___.

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

1. Which of the following is true?
   a) $\bar{x} - M = z$ c) $\overline{2x} - 3M = z$
   b) $3M - 2\bar{x} = z$ d) none of these
2. Which of the following is not the method of graphical representation?
   a) bar chart c) pie chart
   b) line chart d) central tendency
3. If a dice is rolled then what are the total number of outcomes?
   a) 0 c) 5
   b) 4 d) 6
4. If $p = 0.7$, then $q =$__ .
   a) 0.1 c) 0.7
   b) 0.5 d) 0.3
5. A statistical hypothesis which is taken for possible acceptance is called a ___ hypothesis
   a) null c) alternate
   b) population parameter d) none of these
6. For a 3×5 contigency table, the degrees of freedom are __
   a) 7 c) 8
   b) 9 d) 10
7. ___ is the procedure to decide whether to accept or reject the null hypothesis.
   a) census c) test of significance
   b) sampling d) none of these
8. If $F_{cal} < F_{tab}$, then the null hypothesis for F-test is ___
   a) rejected c) accepted
   b) data inadequate d) none of these
9. ___ is an analysis tool used in statistics that looks for significant differences in means, for two or more samples.
   a) ANOVA c) t-test

b) sampling
d) none of these

10. If sum of squares for samples is 4 and degrees of freedom is 2, then the mean sum of squares for samples is __
    a) 3
    c) 2
    b) 5
    d) 6
11. If the number of observation can be counted and is definite then it is called ___ population.
    a) infinite
    c) finite
    b) large
    d) none of these
12. ____ is the method of selecting samples from population.
    a) ANOVA
    c) sampling
    b) t-test
    d) none of these
13. If $CV_x > CV_y$, then x is more ____ than y.
    a) variable
    c) consistent
    b) data inadequate
    d) none of these
14. The mean of the data: x={1,2,3,4,5} is ___
    a) 5
    c) 3
    b) 2.5
    d) 2
15. If a coin is tossed once what is the probability of getting a head?
    a) 0
    c) 0.5
    b) 1
    d) 0.25
16. For a sample 15 observations, degrees of freedom of mean is __
    a) 14
    c) 15
    b) 16
    d) 17
17. In complete enumeration ___ units of population are under study.
    a) all
    c) few
    b) zero
    d) none of these
18. If the coefficient of correlation between x and y i.e. $r < 0$, then x and y have ___ correlation.
    a) positive
    c) negative
    b) zero
    d) none of these
19. Degrees of freedom is the number of ____ observations of the variable.
    a) dependent
    c) independent
    b) total
    d) none of these
20. Which of the following properties is not true for a binomial distribution?
    a) The number of trials are finite
    c) The trials are dependent of each other
    b) There are only two possible outcomes: success and failure
    d) p is constant for each trial

Q.2 Do as Directed.

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

1. Modal class
2. Skewness
3. Positive correlation
4. Sample space
5. Complete enumeration
6. Sample space for rolling a dice.
7. Alternative hypothesis

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

1. Find mode for the following data: $x = \{11, 12, 25, 16, 8, 11, 7, 12, 11, 7, 10, 6, 25, 11\}$.
2. If $\sigma = 2$ and $\bar{x} = 6$, then find CV
3. Define the range of the data x={15, 7, 10, 25, 14, 11, 12}.
4. Write the name of the two methods of simple random sampling.
5. What are the total number of possible samples of size 2 from the population of size 4, when sampling is done with replacement?
6. If the mean for Poisson variable is 2, then find $P(X = 0)$.
7. If $P(A) = 0.5, P(B) = 0.2$ and $P(A \cap B) = 0.1$, find $P(A \cup B)$.

Q.3 Do as directed: (Any five out of six) **(10)**

1. Write two points for '*Sampling is better than complete enumeration*'.
2. Form a sample of size 10 without replacement from a population of size 50 using the following random numbers: $14, 02, 75, 80, 64, 10, 07, 57, 11, 62, 55, 46, 71, 69, 09$
3. Find the two regression coefficients b_{xy} and b_{yx} for the following data:

	x	y
SD (σ)	5	10

Correlation coefficient (r)	0.8

4. If a dice is rolled once, find the probability that the number appearing on it is (a) even and (b) odd.
5. Find the missing values in the following one-way ANOVA table:

Source	SS	df	MS	F_C
Samples	80			
Error		2		
Total	100	12		

6. Find the probability of getting I) king II) red card. From well shuffled cards.

Q.4 Answer the following: (Attempt any three out of four) **(15)**

1. A sample of 4 observations have sample mean 1.75 and standard deviation is 0.8292. test the hypothesis that the mean of the population is 2 at 5% significance level.
2. Draw a bar graph for the following data:

Subject	Maths	Physics	Chemistry	Biology	English
Marks obtained out of 100	85	60	35	80	70

3. In an industry for 200 workers are classified according to their performance and training received or not received as the given below table. Test the independence of performance and training performed using χ^2 test at 5% significance level.

	Performance	
	Good	Not good
Trained	100	50
Untrained	20	30

$(\chi^2_{tab} = 3.84\ at\ \alpha = 5\%\ and\ df = 1)$

4. Find the mean, median and mode for the following data:

x	10	15	20	25
f	9	2	4	6

t Table

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$
one-tail	0.50	0.25	0.20	0.15	0.10	0.05	0.025
two-tails	1.00	0.50	0.40	0.30	0.20	0.10	0.05
df							
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228