Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY

COLLEGE OF AGRICULTURE

B.Sc.(Hons.) Agriculture, Winter 2018 - 19 Examination

Semester: 3 **Date: 29/10/2018**
Subject Code: 20111202 **Time: 10:30am top 1:00pm**
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 marks) **(05)**

1.The mode of the data: 3,2,3,4,3,5,2,5,2,4,5 is _____

2. In binomial distribution np = 5 and npq = 4 then q = _____

3. If A and B are two independent sets then $P(A \cap B)$ = _____

4. If $F_{cal} < F_{tab}$, then the null hypothesis for F-test is _____

5. For a sample 15 observations, degree of freedom of mean is __ _____

6. The median of any given data is 4 and Mean is 2 then Mode is _____ .

7. If the mean for Poisson variable is 2, then find $P(X = 0)$=_____ .

8. If in two way ANOVA, RSS = 540, CSS=490 and TSS=1130, then ESS = _____

9. If $\beta_1 > 0$, then the data distribution is _____ skewed.

10. _____ is an analysis tool used in statistics that looks for significant differences in means, for two or more samples

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

1. A circle in which sectors represents various quantities is called
   a) Histogram c) Line Graph
   b) pie chart d) Bar chart

2 Calculating the difference between the largest and smallest figure produces which Figure?
   a) Mean c) Mode
   b) Median d) Range

3 If both variables X and Y increase or decrease simultaneously, then the coefficient of correlation will be:
   a) Positive c) Negative
   b) One d) Zero

4 When using the chi-square test for differences in two proportions with a contingency table that has r rows and c columns, the degree of freedom for the test statistics will be.
   a) (r-1)(c-1) c) (r-1) + (c-1)
   b) n-1 d) none of these.

5 Total number of students in batch A is _____ (Batch A= 90° Total 100 in class)
   a) 10 c) 21
   b) 12 d) 25

6 By De morgan's law $P(A \cup B)'$ = _____
   a) $P(A \cap B)'$ c) $P(A' \cap B')$
   b) $P(A' \cup B')'$ d) P(A).P(B)

7 When b_{xy} is positive, then b_{yx} will be:

a) Positive
c) Negative
b) One
d) Zero

8. Which of the following is not the method of graphical representation ?

a) Histogram
c) Line Graph
b) pie chart
d) Central tendency

9 In complete enumeration ___ units of population are under study.

a) All
c) Few
b) Zero
d) none of these

10 Testing Ho: $\mu = 25$ against H1: $\mu \neq 25$ leads to:

a) Two-tailed test
c) One-tailed test
b) Right-tailed test
d) Left-tailed test

11 The data distribution is positively skewed if ____ .

a) $\bar{x} = M = z$
c) $\bar{x} < M < z$
b) $\bar{x} > M > z$
d) none of these

12 If one coin is tossed the probability of getting one tail as outcome is __

a) 0.2
c) 0.5
b) 0.25
d) 0

13 If $n = 10$ and $p = 0.5$ for binomial distributed random variable X, then the mean = ___

a) 5
c) 0.5
b) 1.5
d) 0.02

14 A statistical hypothesis which is taken for possible acceptance is called a ___ hypothesis.

a) alternate
c) null
b) statistic
d) none of these

15 Which of the following properties is not true for a binomial distribution?

a) The number of trials are finite.
c) There are only two possible outcomes: success and failure
b) The trials are dependent on each other
d) The probability of success, p is constant for each trial

16 If a dice is rolled then what are the total number of outcomes?

a) 5
c) 4
b) 6
d) 8

17 ____ type of error occurs in sampling.

a) sampling errors
c) non-sampling errors
b) there are no errors in sampling
d) none of these

18 If $t_{cal} < t_{tab}$, then the null hypothesis for t-test is ____ .

a) accepted
c) rejected
b) no conclusion
d) inadequate data

19 Which of the following is the correct formula to evaluate the mean for a frequency distributed data?

a) $\bar{x} = \frac{\sum x}{n}$
c) $\bar{x} = \frac{\sum fx}{\sum f}$
b) $\frac{\sum fx^2}{n}$
d) none of these

20 Absolute skewness = _____ .

a) $\bar{x} - z$
c) $z - M$
b) $\bar{x} - M$
d) none of these.

Q.2 Do as Directed.

A. Define the following. (Any five) **(05)**

1. Define regression line Y on X.
2. Define Binomial distribution.
3. Define addition theorem of Probability.
4. For a Poisson variable, mean = 6.2 and variance = 2.3. (True/False)
5. The total number samples, each of size 2 possible if population has 7 observations and sampling is done without replacement.
6. What is the formula for t –test for one sample for Mean.
7. Define Sampling.

B. Answer the following. (Any Five) **(05)**

1. If cov(x,y)=0.6 and s.d (x) = 0.2 and s.d(y) = 5 then find r.
2. Write the sample space for three coins tossed.
3. If $\sigma = 2$ and $\bar{x} = 6$, then find CV
4. The median of given data is 20,15,25,28,18,16,30
5. Which method is used for selecting samples from population.
6. Define the range of the data x={15, 7, 10, 25, 14, 11, 12}.
7. If $b_{xy} = 0.4$ and $b_{yx} = 0.8$ then What is the value r ?

Q.3 Write short notes. (Any five) **(10)**

1. A sample of 4 observations have sample mean $\bar{x} = 1.75$ and $S^2 = 0.6875$. test the hypothesis that the mean of the population is 2.(level of significance 5%)
2. If 10% screws are defective ,find the probability that out of 5 screws chosen at random,
   (i) None is defective (ii) one is defective.
3. Find the Mean for the following data

X	1	2	3	4	5
F	10	15	12	13	8

4. The probability that a student passes a physics test is 2/3 and the probability that he passes both physics and English tests is 14/45. The probability that he passes at least one test is 4/5.what is the probability that he passes English test?
5. Prepare one-way ANOVA for the following data:
   Number of samples: 5
   Total number of observations: 20
   Sum of squares due to samples: 160
   Total sum of squares: 300
6. The distance in Km travelled by 4 salesman in a week are as below, Draw a bar Graph to represent the data.

Salesman	P	Q	R	S
F	413	264	597	143

Q.4 Attempt any Three/Long Questions/Example **(15)**

1. For a given data X and Y, Which is more variable.

X	7	4	3	5	1
Y	2	10	1	3	6

2. A card is drawn from a pack of 52 playing cards. Find the probability of getting
   (i) A king card (ii) a red card (iii) a face card (iv) card between 2 and 7
   (v) a red card and a black card.

3. The following data has been obtained for rainfall received and the output in the farm due to the rains:

	Rainfall (cm)	Output (quintals)
Mean	30	50
SD	5	10
Correlation coefficient	0.8	

(a) Find the two regression coefficients b_{xy} and b_{yx}.

(b) Find the two regression lines.

(c) Find the likely production corresponding to the rainfall of 40 cm.

4. 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

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

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
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131