SEAT No._____

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[1163]

SARDAR PATEL UNIVERSITY

External Examination

M.Sc. (Zoology) Semester –I

Subject: PS02EZOO21- Biostatistics

Wednesday, 27th March, 2019

Time: 10:00 a.m. to 01:00 p.m. **Total marks: 70**

Note: *Figures to right side indicate marks.*

Q.1 Choose the most appropriate alternative for the following: [8]

1. To verify whether two dependent samples have been drawn from populations having equal means, which test if most suitable?
   A) Paired t-test B) Two sample t-test
   C) ANOVA D) Chi-square test
   E) None of Above

2. Normal probability distribution is suitable for handling probability of _____ random variable.
   A) Individual B) Discrete
   C) Continuous D) All of Above
   E) None of Above

3. Analysis of variance is a statistical method of comparing the _____ of several populations.
   A) Standard Deviation B) Mean
   C) Variances D) Median
   E) None of Above

4. Editing of primary data is done for:
   A) Completeness B) Consistency
   C) Accuracy D) All of Above
   E) None of Above

5. The value of second quartile (Q_2) is equals to:
   A) Mean B) Mode
   C) 50th Percentile D) 4th Deciles
   E) None of Above

6. The shape of normal curve is similar to the shape of _____
   A) Less than Ogive B) More than Ogive
   C) Frequency Polygon D) Frequency Curve
   E) None of Above

(P.T.O.)

7. In negatively skewed distribution relation between mean, median and mode is:

A) Mean > Median > Mode
B) Mean < Median < Mode
C) Median > Mean > Mode
D) All of Above
E) None of Above

8. Events are said to be _____when one does not occur more often than the others.

A) Mutually Exclusive
B) Equally likely
C) Dependent
D) All of Above
E) None of Above

Q.2 Attempt any seven of the following: **[14]**

1. Define sample. Write down the merits and demerits of sample survey.
2. Explain various types of correlation with the help of scattered diagrams.
3. Enlist the various measures of dispersion. Discuss anyone of them with its importance.
4. Prove P(A) + P(B)=1.
5. Define statistics and explain various sequential stages of statistical investigation.
6. Differentiate between paired t-test and two sample t-test.
7. Give the relationship between A.M., H.M. and G.M. and prove it.
8. State BAYES' theorem and derive the BAYES' Equation.
9. Explain null hypothesis and alternative hypothesis?

Q.3 A. Find the missing frequency "x" from the given data table. If the mean of given data is 19.9. **[6]**

No. of leaves	4-8	8-12	12-16	16-20	20-24	24-28	28-32	32-36
No. of Plants	11	13	16	14	"x"	9	17	6

B. Draw (i) Histogram (ii) Frequency polygon and (iii) Percentile curve using following data in your answer sheet: **[6]**

Molecular weight in Mole	10-15	15-20	20-25	25-30	30-35	35-40	40-45
No. of Protein	12	24	32	20	17	17	13

OR

B. Give equations for computing Kelly's coefficient of skewness with the meaning and equation of each symbol in equation. **[6]**

Q.4 A. Calculate value of coefficient of variation for following data. [6]

No. of leaves	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of flowers	5	9	13	21	20	17	7	3

B. Calculate value of mean for following data. [6]

No. of leaves	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of flowers	5	9	13	21	20	17	7	3

OR

B. From the following data obtain the regression equations of X on Y. [6]

Sr. No.	1	2	3	4	5
No. of Proteins	6	2	10	4	8
No. of Active sites	9	11	5	8	7

Q.5 A. Define and describe statistical inference? Discuss various steps of hypothesis testing; also discuss about four possibilities of results when hypothesis is tested in statistic. [6]

B. The manufacturer of certain makes drug claims that his drugs have a mean dissolution time of 25 minutes with standard deviation of 5 minutes. A random 6 sample of such drug were taken to test dissolution time and it gave the following dissolution time : [6]

Dissolution time of six drugs in minutes	24	26	30	20	20	18

Carry out "**t - test**" for the data and comment on the claim of the manufacturer is valid or not at 1% level of significance. (Value of "t" at 1% level of significance is 4.032)

OR

B. Sperm sample was analyzed for having normal or abnormal morphological features. 400 sperms were analyzed and found that 216 sperms were abnormal. Test the hypothesis that the sperm sample has 50% of normal and 50% of abnormal sperms in it by using the standard error for testing the number of successes at 5% level of significance. (at 5% level of significance value of S.E. = 1.96SE) [6]

Q.6 A. Find value of value of Karl Pearson's coefficient of correlation for the following data. [6]

No. of leaves (X)	48	35	17	23	47
No. of flowers (Y)	45	20	40	25	45

B. In an experiment to study the dependence of hypertension on smoking habits, the following data were taken on 180 individuals. [6]

	nonsmokers	*Heavy smokers*
Hypertension	21	66
No hypertension	74	19

Test the hypothesis that the presence or absence of hypertension is independent of smoking habits at 5% level of significance using χ^2 test. (For $\upsilon = 1$, value of χ^2 at 5% level of significance is 3.84)

OR

B. Two random samples were drawn from two normal population and their values are as follows: [6]

Sample 1	66	67	75	76	82	84	88	90	92	--	--
Sample 2	64	66	74	78	82	85	87	92	93	95	97

Test whether the two populations have the same variance at the 5% level of significance using "F" test. (For $\upsilon = 10$ and $\upsilon = 8$, value of F at 5% level of significance is 3.36)

—X—