C 31184 (Pages : 4) Name.....

Reg. No.....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2017

(CUCBCSS—UG)

Complementary Course

MBY 3C 11—BIO–STATISTICS—I

Time Three Hours Maximum : 64 Marks

Use of calculator is permitted.

Part A

Answer **all** *questions.*
Each question carries ½ mark.

Fill in the blanks (Questions 1-4) :

1. The most popular method of presenting a frequency distribution graphically is ———
2. Most commonly used average for ordinal scale of measure is ———
3. Statistical constant of a population is called ———
4. Values of the variable which divide the total frequency into four equal parts are known as ———

Choose the correct answer (Questions 5-8)

5. The probability of picking a card that is red or black is :

   (a) 0 (b) 0.5

   (c) 0.75 (d) 1

6. Mean and variance of a binomial distribution are respectively 4 and 3, Then, probability of getting success in a single trial is :

   (a) $\frac{1}{3}$ (b) $\frac{1}{5}$

   (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

7. Variance of a chi-square distribution with 10 degrees of freedom is :

   (a) 20 (b) 10

   (c) 5 (d) $\frac{1}{10}$

Turn over

8. If the variance of normal distribution is 9, then quartile deviation is :

(a) $\frac{12}{5}$ (b) 3

(c) 6 (d) 2

State True *or* false (Questions 9-12) :

9. Geometric mean is a positional average.
10. Nominal scales are used for labeling variables.
11. t distribution is a symmetrical distribution.
12. Standard deviation is a relative measure of dispersion.

(12 × ½ = 6 marks)

Part B (Short Answer Type Questions)

Answer **all** *questions.*
Each question carries 2 *marks.*

13. What are different types of classification ?
14. Find the harmonic mean of 5,12, 9, 6,10, 18.
15. Define random experiment. Write down the sample space for the random experiment of tossing a coin three times.
16. What is Bernoulli trial ? Give the probability function of Bernoulli distribution.
17 Distinguish between census and sample method.
18. State any two applications of chi-square distribution.
19. Define standard normal distribution. What are the mean and variance of the distribution ?
20. Find mean deviation about median of 1500, 1250, 2000, 1850, 1000, 288, 1750, 1300, 1000, 2000.
21. One card is drawn from a standard pack of 52 cards. What is the probability that it is either a king or a queen ?
22. Write down the pdf of F distribution.

(10 × 2 = 20 marks)

Part C (Short Essays)

Answer any **six** *questions.*
Each question carries 3 *marks.*

23. Distinguish between nominal and ordinal scales with examples

24. What are ogives ? Explain the method of obtaining median from ogives.

25. Define addition theorem and multiplication theorem on probability.

26. The following data shows the laboratory measurements (in mg/dl) of fasting blood sugar of 130 patients. Represent the data by means of a histogram :

Fasting Blood sugar :	120-135	135-150	150-165	165-195	195-225	225-285	285-345
No. of patients	8	22	12	24	32	24	8

27. Following table gives the mean and variance (in rupees) of food expenditure per family per week among the working class families in two localities :

Families	Mean	Variance
Family A	640	243.36
Familiy B	580	327.61

Which family is more consistent with respect to the expenditure pattern ?

28. According that one in 80 births in cases of twins, calculate probability of 2 or more sets of twins on a day when 30 births occur using Poison approximation.

29. What is chi-square statistic ? Give the pdf of chi-square distribution with n degrees of freedom.

30. Find the parameter p for a binomial random variable X if n = 6 and 9 P (X = 4) = P (X = 2)

(6 × 3 = 18 marks)

Part D (Essays)

Answer any **two** *questions.*
Each question carries 10 *marks.*

31. (i) Point out any four properties of normal distribution.

(ii) A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson variate with mean 1.5. Calculate the proportion of days on which some demand is refused.

(iii) Define students *t* distribution. Give any two applications of t distribution.

32. (i) The probability that India wins a cricket test match against Australia is $\frac{1}{3}$. India and Australia play three test matches

What is the probability that ?

(a) India will lose all the three testes and

(b) India will win at least one test match ?

(ii) Fit a binomial distribution to the following data :

x	0	1	2	3	4
f	28	62	46	10	4

33. (i) Explain the desirable properties of a good average. How far does mode meet these requirements ?

(ii) Find the mean and standard deviation of the following frequency distribution :

Class	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	3	61	132	153	140	51	2

(2 × 10 = 20 marks)