

C 4012

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Name.....

Reg. No.....

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2016

(CUCBCSS-UG)

Complementary Course

MBY 4C 16—BIOSTATISTICS (PRACTICAL)

Time : Three Hours

Maximum : 80 Marks

Scientific calculator and Statistical tables are permitted.

Part A (One Word Questions)

Answer all questions.

Each question carries $\frac{1}{2}$ mark.

1. What is the mean of first 10 natural numbers ?
2. The mode of distribution of values 33, 14, 23, 12, 34, 12, 35, 23, 12, 34 is _____
3. Geometric mean of two numbers $\frac{1}{16}$ and $\frac{4}{25}$ is _____
4. What is the range of the observations 23, 67, 48, 96, 76, 95, 76, 80 ?
5. The mean and standard deviation of a binomial distribution are 81 and 3 respectively, then probability of getting success in a single trial is _____
6. If the regression coefficients in a bivariate distribution are $\frac{1}{18}$ and $-\frac{1}{32}$, the coefficient of correlation is _____
7. The probability of getting one head and one tail in two tosses of an unbiased coin is _____
8. If Z is a standard normal random variable, then $P(-1 \leq Z \leq 1)$ is _____
9. Variables X and Y are connected by the equation $3X - 4Y + 7 = 0$. Correlation between X and Y is _____
10. If Z is a standard normal variate, then $V(Z^2) =$ _____
11. A random variable X takes values 2 and -1 with respective probabilities $\frac{3}{4}$ and $\frac{1}{4}$. What is $E(X)$?
12. If X is a Poisson random variable with variance 4, what is the mean of X ?

(12 x $\frac{1}{2}$ = 6 marks)

Turn over

Part B (Short Answer Questions)*Answer all questions.**Each question carries 2 marks.*

13. Find the harmonic mean of 12 and 16.
14. The arithmetic mean of 20 and 30 observations are 15 and 18 respectively. Compute the mean of combined sample of 50 observations.
15. Compute the standard deviation of 5, 4, 8 and 3.
16. Obtain the value of chi-square statistic from the following contingency table under the independence of attributes :

10	12
18	20

17. Let the regression lines are $4X - 5Y + 33 = 0$ and $20X - 9Y - 107 = 0$. Compute the mean values of X and Y.
18. If X follows Poisson distribution with mean 0.6, what is $P(X = 1)$?
19. The probability of a man hitting a target is $\frac{1}{4}$. If he fires 7 times, what is the probability of hitting the target at least twice ?
20. X is normally distributed with mean 12 and variance 16. Compute $P(X \geq 20)$.
21. A die is thrown 9000 times and a throw of 3 or 4 is observed at 3240 times. Is the die unbiased ?
22. Find quartile deviation of the following data :
20, 28, 40, 12, 30, 15, 50.

(10 x 2 = 20 marks)

Part C (Short Essay Questions)*Answer any six questions.**Each question carries 5 marks.*

23. Represent the following data by Histogram :

Weight (in kg.)	35-40	40-45	45-50	50-55	55-60	60-65
No. of persons	12	30	22	30	18	10

24. Calculate the median from the following data :

Marks	No. of students
Less than 80	100
Less than 70	90
Less than 60	80
Less than 50	60
Less than 40	32
Less than 30	20
Less than 20	13
Less than 10	5

25. In a trivariate distribution, $r_{12} = 0.7$, $r_{23} = r_{13} = 0.5$, find the multiple correlation coefficient R_{123} and the partial correlation coefficient $r_{23.1}$.
26. In a cross between red flowered and white flowered plants, it was found that of the 452 flowers obtained 119 were white and the rest red. Is this consistent with the hypothesis that red and white flowers are in the ratio 3 : 1 ?
27. The ranks of 15 students in two subjects A and B are given below. The two numbers within brackets denote ranks of the same student in A and B respectively :
- (1, 10), (2, 7), (3, 2), (4, 6), (5, 4), (6, 8), (7, 3), (10, 1), (9, 1), (10, 15), (11, 19), (12, 5), (13, 14), (14, 12), (15, 13).
- Find the Spearman's rank correlation coefficient.
28. The mean of runs scored by three batsmen, Sathyan, Sivan and Vijayan in the same series of 10 innings are 50, 48 and 12 respectively. The standard deviations of their runs are respectively 15, 12 and 2. Who is the most consistent of the three ? If one of the three is to be selected, who will be selected ?
29. In a certain factory turning out optical lenses, there is a small chance $\frac{1}{500}$ for any one lens to be defective. The lenses are supplied in packets of 10. Use Poisson distribution to calculate the approximate number of packets containing two defective lenses in a consignment of 20,000 packets.
30. A random sample of 27 pairs of observations from a normal population gave a correlation coefficient of 0.6. Test whether the population correlation coefficient is significant or not.

(6 x 5 = 30 marks)

Turn over

Part D (Essay Questions)

*Answer any two questions.
Each question carries 12 marks.*

31. The daily wages of 1000 workers are normally distributed around a mean of 70 and with a standard deviation of 5. Estimate the number of workers whose weekly wages will be ;

- (i) Between 70 and 72.
- (ii) More than 75.
- (iii) Less than 63.
- (iv) Estimate the lowest daily wages of the 100 highest paid workers.

32. Calculate the regression equations of Y on X and X on Y from the following data and estimate X when Y = 100 :

X :	91	97	108	121	67	124	51	73	111	57
Y :	71	75	69	97	70	91	39	61	80	47

33. The following table gives monthly sales (in thousands of rupees) of a certain firm in three states its four salesmen :

States	Salesmen			
	I	II	III	IV
A	6	5	3	8
B	8	9	6	5
C	10	7	8	7

Perform a two way analysis of variance and draw your conclusion.

(2 x 12 = 24 marks)