C 62603 (Pages : 4) Name.....

Reg. No.....

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, MAY 2019

(CUCBCSS—UG)

Microbiology

MBG 2C 04—BIOSTATISTICS—II

(2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Use of calculator is permitted.

Section A

Answer all *questions in one word each.*
Each question carries ½ marks.

1. Probability of first kind error is called the ~~of the test.~~
2. Power of a test is related to _____
3. The allocation of treatments units with equal probability is known as _____
4. Visual representation of a bivariate data is known as _____
5. If $r = 1$, the relationship between b_{yx} and b_{ry} is _____
6. The range of Pearson's co-efficient of correlation is _____
7. Partial regression co-efficient is lying between _____

Write True *or* False :

8. Correlation between age and sex of a group of Students is 1.89.
9. If X and Y are independent, the value of regression co-efficient b_{yx} *is* equal to one.
10. Power of a test is equal to 1- P [Type 1 error).
11. In a completely randomized design with *t* treatments and *it* experimental units, error degrees of freedom is equal to n — *t.*
12. In analysis of variance, the total variance splitted into component variances.

(12 x ½ = 6 marks)

Section B

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

13. Define size of test.
14. Define alternative hypothesis.

Turn over

15. Explain independence of attributes.

16, What is the principle of least squares ?

17. Write down the model for two way ANOVA.

18. Give necessary and sufficient condition for the regression planes, X_1 on X_2 and X_3 ; X_2 on X_1 and X_3 and X_3 on X_1 and X_2 to be coincident.

19. What is contingency table ?

20. Given the regression lines X + 2Y = 5 and 2X + 3Y = 8 and $a_y^2 = 4$, find the value of a_x^e ?

21. Discuss the type of errors in testing of hypothesis.

22. Outline the conditions for the validity of χ^2 test.

(10 x 2 = 20 marks)

Section C

Answer any six *questions.*
Each question carries 5 *marks.*

23. Give the formula for calculating Statistic X^2 in case of Contingency table of order 2*2.

24. The following measurements show the respective heights in inches of ten fathers and their eldest sons,

Father (X)	67	63	66	71	69	62	62	70	61	72
Son (Y)	68	66	65	70	69	67	64	71	60	63

Find the regression line of Son's height on Father's height.

25. What is rank correlation? How would you tackle the situation when ranks are equal?

26. From the following regression equations, find the mean values of X and Y series

8X — 10Y = -- 66

40X — 18Y = 214

27. The theory predicts the proportion of beans in the four groups A, B, C and D should be 9 : 3 : 3 : 1. In an experiment among 1,600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory ?

28. From the data relating to the yield of dry bark (X_1), height (X_2) and girth (X_3) for 18 Cinchara plants, the following correlation co-efficients were obtained.

$r12 = 0.77$, r_{23}. 0.52, $r_{13} = 0.72$. Find the partial correlation co-efficient $r_{12.3}$ and multiple correlation co-efficient 81.23.

29. Prepare ANOVA table for the null hypothesis for the following data :

A	B	C
75	74	60
70	78	64
66	72	65
69	68	55

Twelve plots are divided into 3 groups. Fertilizers A and B are applied to first two groups while third group is a control C with no fertilizers.

30. The following table showing the distribution of digits in numbers chosen from a telephone directory.

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency	1,026	1,107	997	966	1,075	933	1,107	972	964	853	10,000

Test whether the digits may be taken to occur equally frequently in the directory.

(6 x 5 = 30 marks)

Section D

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

31. (a) What is meant by Correlation ?

(b) Calculate Pearson's co-efficient of correlation for the following

Adult Cost (in '000)	39	65	62	90	82	75	25	98	36	78
Sales(in lakh Rs.)	47	53	58	86	62	68	60	91	51	84

32. (a) What do you understand by regression ?

(b) From the following data, obtain two regression equations :

Sales	91	97	108	121	67	124	51	73	111	57
Purchases :	*71*	75	69	97	70	91	39	61	80	47

33. (a) Give the concept and definition of partial correlation co-efficient.

(b) A opinion poll was conducted to find the relation to a proposed civic reform in 100 members of each of the two political parties as below :

	Favourable	*Unfavourable*	*Indifferent*
Party A	40	30	30
Party B	42	28	30

Test for independence of reactions with the party affiliations given that $X^2_{0.05}(^2) = 5.99$.

(2 x 12 = 24 marks)