

D 103778

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Name.....

Reg. No.....

**SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2024**

Microbiology

MBG 2C 04—BIOSTATISTICS—II

(2019—2023 Admissions)

Time : Two Hours

Maximum : 60 Marks

Part A (Short Answer Type Questions)

Maximum marks that can be scored from the Part is 20.

Each question carries 2 marks.

1. What is a test statistic ?
2. Define (i) Type I error ; and (ii) Type II error.
3. Explain the concept of regression.
4. Give the mathematical model of two-way ANOVA with interaction.
5. Mention the uses of χ^2 test.
6. What is Randomisation ?
7. State any *two* properties of correlation co-efficient.
8. Write the expression for multiple correlation co-efficient $R_{1.23}$ in terms of simple correlation co-efficients.
9. What are the conditions for using χ^2 distribution for testing agreement between theoretical frequencies and observed frequencies ?
10. If $r_{12} = 0.7$, $r_{13} = 0.61$ and $r_{23} = 0.4$, find $r_{13.2}$.
11. Distinguish between simple and composite hypothesis.
12. If the regression line of Y on X and X on Y are given, then how will you obtain the means of X and Y ?

Turn over

Part B (Short Essay/ Paragraph Type Questions)

Maximum marks that can be scored from the Part is 30.

Each question carries 5 marks.

13. If the regression line of y on x is $5x - 6y + 90 = 0$ and the regression line of x on y is $15x - 8y - 130 = 0$, find the means of x and y , the regression co-efficients and the correlation co-efficient.
14. Explain Chi-square test of independence.
15. The rank correlation co-efficient of marks in statistics and mark in mathematics are obtained by a certain group of students is 0.8. If the sum of squares of the difference in ranks is given to be 33, find the number of student in the group.
16. Explain the procedure to carry out ANOVA (one-way classification).
17. If $r_{12} = 0.80$, $r_{13} = -0.40$ and $r_{23} = -0.53$, find the values of $R_{1.23}$ and $r_{12.3}$.
18. Explain partial correlation and multiple correlation.
19. Explain the test procedure for testing the significance of correlation.

Part C (Essay Type Questions)

*Answer any **one** question. The question carries 10 marks.*

Maximum marks that can be scored from this Part is 10.

20. Find the rank correlation co-efficient between poverty and overcrowding from the table below :

Town	:	A	B	C	D	E	F	G	H	I	J
No : per 200 household below											
minimum standard of living	:	17	13	15	16	6	11	14	9	7	12
Overcrowding	:	36	46	35	24	12	18	27	22	2	8

21. In the surgical treatment of duodenal ulcers there are three different operations corresponding to the removal of various amounts of the stomach. The three operations are denoted A, B and C with A being the least traumatic and C the most traumatic. It is known that these operations have an undesirable side effect to some patients. In cases where the side effect is present, it can be classified as being of "slight degree" or of "moderate degree". The data in the following table relate to a group of 417 patients and specify the operation received and, where relevant, the degree of the side effects suffered.

Existence/degree of side effects				
Operation	None	Slight	Moderate	Total
A	63	26	7	96
B	126	63	25	214
C	51	40	16	107
Total	240	129	48	417

Perform a χ^2 test on this table to investigate the independence between level of operation and existence/degree of side-effects. Use $\alpha = 0.05$.

(1 × 10 = 10 marks)