Micro

C 80922 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2020

Microbiology

MBY 4C 16 (P)—BIOSTATISTICS (PRACTICAL)

(2014 Admissions)

Time : Three Hours Maximum : 32 Marks

Use of Calculator and Statistical table is permitted.

Part A

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

Fill in the blanks (Questions 1-3) :

1. For testing independence of attributes we use ———— test.
2. The degrees of freedom for 2 × 2 contingency table under chi square test for independence of attributes is ————.
3. The correlation co-efficient between U = X and V = – X is ————.

State True *or* False (Questions 4-6) :

4. ANOVA is used to test the significance of equality of several means.
5. A co-efficient of correlation is computed to be – 0.95 means that the relationship between two variables is weak.
6. When regression line passes through the origin then Correlation is zero.

(6 × ½ = 3 marks)

Part B (Short Answer Type Questions)

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

7. The two regression lines are given by $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$. If variance of x is 12 determine the variance of y.
8. Two independent random variables X and Y having variances 36 and 16 respectively. Calculate the correlation co-efficient between U and V such that U = X + Y and V = X – Y.

Turn over

9. In a trivariate population $r_{12} = 0.13, r_{13} = 0.25, r_{23} = 0.33$. Find multiple correlation co-efficient $R_{3.12}$.

10. Compute the chi-square statistic for testing independence of attributes for the following contingency table :

Area	Votes for		
	A	B	Total
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

11. Develop One Way ANOVA table from the following information :

Number of treatments = 5 ; Total number of observations = 25 ; Total Sum of Squares = 286.5; Treatment Sum of Squares = 114.6.

(5 × 2 = 10 marks)

Part C (Short Essays)

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

12. The following table shows the type of mental disorder cross classified by group membership (1) those with family problems but without mental disorders, (2) those with both family problems and mental disorders, and (3) those with mental disorder but not family problems) and source of referral :

Source of Referral	Type of Problem		
	(1)	(2)	(3)
Self	15	37	16
Family	25	25	17
Mental health agency	12	40	27
Court	11	4	1
Other health agency	9	23	14
Other	3	8	1

Test whether mental problem category and source of referral are related.

13. Perform One way ANOVA for the following data :

Treatment	Replication			
	r_1	r_2	r_3	r_4
A	24	23	22	19
B	26	27	21	
C	28	24	19	22
D	22	28	27	

14. The face sheet of patients records maintained in a local health department contains 10 entries. A sample of 100 records revealed the following distribution of erroneous entries :

Number of Erroneous entries out of 10	Number of records
0	8
1	25
2	32
3	24
4	10
5 or more	1
Total	100

Test the goodness of fit of these data to the binomial distribution with $p = 0.20$.

15. Construct the two regression lines from the following information.

$n = 7$; $\sum x = 113$, $\sum y = 193$, $\sum x^2 = 1983$, $\sum y^2 = 5549$ and $\sum xy = 3302$.

Also estimate Y when X = 15 units.

(3 × 3 = 9 marks)

Part D (Essays)

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

16. A market analysis believes that there is no difference in preferences of television viewers among the four Indian cities of Delhi, Mumbai, Chennai and Kochi. To test this belief, independent random samples of 150, 200, 250 and 200 persons were selected from the four cities and asked, "what type of program do you prefer most : mystery, soap, comedy or news documentary ?" The following responses were recorded :

	City			
Program type	Delhi	Mumbai	Chennai	Kochi
Mystery	50	70	85	60
Soap	45	50	58	40
Comedy	35	50	72	67
News	20	30	35	33
Sample Size	150	200	250	200

Test whether there is any association between program type and city.

17. Perform a two way ANOVA for the following data for testing the significant difference of treatment and block :

	Block				
Treatment	A	B	C	D	E
T_1	58	68	60	68	64
T_2	62	70	65	80	69
T_3	67	78	68	81	70
T_4	70	81	70	89	74

(1 × 10 = 10 marks)