D 42007 **(Pages : 3)** **Name**.....

Reg. No.....

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2018

(CUCBCSS—UG)

Complementary Course

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

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. In ANOVA, if between treatments mean sum of squares is 444 and variance ratio is 2.5, then within treatments mean sum of squares is ————.
2. If one of the regression coefficient in a bivariate distribution is 0.9 and correlation coefficient is 0.6, then value of other regression coefficient is ————.
3. With the usual notations, if $r_{12} = 0$ and $R_{1.23} = 0.5$, then $r_{13.2}$ = ————.

State True *or* False (Question 4 – 6) :

4. A correlation co-efficient of 0.5 means that 50% of the data are explained.
5. The degrees of freedom for 4 × 3 contingency table under chi-square test of independence of attributes is 7.
6. If $R_{1.23} = 0$, then X_1 is uncorrelated with X_2 and X_3.

(6 × ½ = 3 marks)

Part B (Short Answer Type Questions)

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

7. Form the ANOVA table from the following information :

   Between varieties : Sum of Squares = 28, Mean Sum of Squares = 14

   Within varieties: Degrees of freedom = 15

   Total : Sum of Squares = 64.

Turn over

8. Given the following data in a bivariate distribution :

$\bar{X} = 50.5$, $\bar{Y} = 10.5$, $\sigma_x = 10$, $\sigma_y = 2$ and $r_{xy} = 0.6$.

Estimate the value of X when Y = 13.5.

9. Compute the value of chi-square statistic from the following contingency table under the independence of attributes :

	Region I	Region II
Families consuming tea	56	31
Families not consuming tea	18	6

10. In a bivariate distribution, for five pairs of observations, $\bar{X} = 3$, $\bar{Y} = 11$, $\Sigma(X-\bar{X})^2 = 10$, $\Sigma(Y-\bar{Y})^2 = 374$, $\Sigma(X-\bar{X})(Y-\bar{Y}) = 60$. Find the correlation between X and Y.

11. If $r_{12} = 0.28$, $r_{13} = 0.51$ and $r_{23} = 0.49$, compute the partial correlation coefficient $r_{23.1}$.

(5 × 2 = 10 marks)

Part C (Short Essay)

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

12. Regression equations in a bivariate data are $8x - 10y + 66 = 0$ and $40x - 18y - 214 = 0$. Find

(i) Mean values of X and Y.

(ii) Regression coefficients and correlation coefficient.

(iii) If variance of X is 9, what is variance of Y ?

13. A random sample of 27 pairs of observations from a normal population gave a correlation coefficient of 0.6. Is this significant of correlation in the population ?

14. If $r_{12} = 0.5$, $r_{13} = 0.3$ and $r_{23} = 0.45$, Compute $R_{1.23}$ and $R_{3.12}$.

15. Out of 8,000 graduates in a town 800 are females ; out of 1,600 graduate employees 120 are females. Determine whether any distinction is made in the appointment on the basis of sex.

(3 × 3 = 9 marks)

Part D(Essay)

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

16. (i) A survey of 800 families with four children each revealed the following distribution :

Number of boys	0	1	2	3	4
Number of girls	4	3	2	1	0
Number of families	32	178	290	236	44

Is this result consistent with the hypothesis that male and female births are equally probable ?

(ii) Find the regression line of Y on X from the following data :

X	:	40	60	66	75	80	90	100
Y	:	80	45	65	40	85	90	70

17. The following data represent the number of units of production per day turned out by five different workmen using four different types of machines :

Machine type

		A	B	C	D
Men	I	44	38	47	36
	II	46	40	52	43
	III	34	36	44	32
	IV	43	38	46	33
	V	38	42	49	39

(i) Test whether the mean productivity is the same for the four different machine types.

(ii) Test whether the five men differ with respect to mean productivity.

(1 × 10 = 10 marks)