Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/HM/SEM-3/BHM-302/2012-13

2012

BIO-STATISTICS-II

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Objective Type Questions)

1. Answer any *ten* of the following questions : 10 × 1 = 10

A) Answer the following question :

i) If $P(A) = \frac{1}{5}$, $P(B) = \frac{1}{2}$ and $P(A \cup B) = \frac{4}{5}$, find $P(A \cap B)$.

B) Choose the correct alternatives for the following :

ii) Monthly income of a person is classified by

a) discrete variable b) continuous variable

c) primary data d) secondary data.

iii) The A. M. of two observations is 36 and their G.M. is 24. Then H.M. is

a) 16 b) 24

c) 36 d) 48.

iv) If A, B & C are mutually exclusive, equally likely and exhaustive, then $P(B)$ is

a) $\frac{1}{2}$ b) 0

c) $\frac{1}{3}$ d) 1.

v) If mean and median of a frequency distribution are 20 and 17 respectively, the mode is

a) 10 b) 11

c) 12 d) 13.

vi) If $r = 0.6$, cov $(x, y) = 12$ and S.D. of $y = 5$ then S.D. of x is

a) 3 b) 4

c) 5 d) 0.

vii) Probability of a sure events is

a) 1 b) 0

c) 2 d) 3.

viii) If item is increased by 10, then the standard deviation will

a) Reduce by 10

b) increas by 10

c) Remain unchanged

d) 0.

ix) Correlation between age and blood pressure is

a) positive b) negative

c) zero d) none of these.

x) The parameters of normal distribution are

a) mean & median b) mean & mode

c) mean and S.D. d) none of these.

xi) The Skewness of normal curve is

a) 1 b) – 1

c) 0 d) 2.

xii) A Sample is small sample if

a) $n > 30$ b) $n < 30$

c) $n = 20$ d) $n = 1$.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. A problem of Bio-statistics is given to 3 students whose chances of solving are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$. What is the probability that the problem is solved ?

3. Nine students obtained percentage of marks in college slot test (X) and in WBUT examination (Y). Calculate the correlation co-efficient.

X	51	63	73	46	50	60	47	36	60
Y	49	72	74	45	58	66	50	30	35

4. A certain stimulus administered to each of 12 patients resulted in the following changes in blood pressure : 5, 2, 8, – 1, 3, 0, – 2, 1, 5, 0, 4, 6. Can it be concluded that the stimulus will in general be accompanied by an increase in blood pressure ? (Given for 11 d.f. $t_{.05} = 2.2$)

5. If $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, $P(A + B) = \frac{1}{4}$. Then obtain $P(AB^C)$.

6. The mean weekly sales of soap bars in depertmental stores was 146.3 bars per store. After and advertising compaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation 17.2. Was the advertising campaign successful ? (Given that 5% value of t for 21 d.f. is 1.72)

   (Use t-test).

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) You are given that the variance of x is 9. The regression equations are $8x - 10y + 66 = 0$ and $40x - 18y = 214$. Find (i) average values of x and y, (ii) correlation coefficient between the two variables and (iii) standard deviation of y.

b) A die is thrown 150 times with the followings results :

No. turned up :	1	2	3	4	5	6
Frequency	19	23	28	17	32	31

Test the hypothesis that the die is unbiased.

(Given the tabulated value of chi-square for 5 d.f. is 11.07) 8 + 7

8. a) For a group of 200 candiadates the mean and standard deviation of scores were found to be 40 and 15 respectively. Later on it was found that the scores 43 and 35 were mis-read as 34 and 53 respectively. Find the corrected mean and standard deviation corresponding to the corrected figures.

b) If the letters of the word 'RANDOM' be arranged at random, what is the chance that there are exactly two leters between *A* and *O* ? 9 + 6

9. a) If two dice are thrown, what is the probability that the sum is

   i) greater than 8

   ii) neither 7 nor 11 ?

   b) The theory predict the proportion of beans in the four groups *A, B, C* and *D* should be 9 : 3 : 3 : 1. In an experiment among 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory ?

   (Given that 5% value of χ^2 for 3 d.f. is 7.815)

   (Use Chi-square test). 6 + 9

10. a) In an infantile paralysis epidemic, 500 persons contracted the disease. 200 received no serum treatment and of these 75 became paralysed. Of those who did receive serum treatment 65 became paralysed. Was the serum treatment effective ? 7

   b) Construct a pie chart for the following data : 8

   Principal exporting countries of Cotton :

Countries	USA	India	Egypt	Brazil	Argentina
1000 bales	6,367	2,999	1,688	650	202

11. a) State and prove Baye's theorem and its application in the community. 8

b) The mean weight of 600 male students is 151 kg and the S.D. is 15 kg. Assuming that the weights are normally distributed, find how many students weigh :

i) Between 120 and 155 kg

ii) More than 155 kg [Given that ϕ (0.27) = 0.6064 and ϕ (2.07) = 0.9808 where ϕ (Z) denotes the area under standard normal to the left of ordinate at Z]. 7