



Name :
Roll No. :
Invigilator's Signature :

CS/B.OPTM/SEM-6/BO-603/2013

**2013
BIO-STATISTICS**

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.*

Graph sheet(s) will be supplied by the institution.

**GROUP - A
(Multiple Choice Type Questions)**

1. Choose the correct alternatives for any *ten* of the following :
10 × 1 = 10
- i) Correlation coefficient depends on
 - a) origin
 - b) scale
 - c) both (a) and (b)
 - d) none of these.
 - ii) The median of the following data :
12, 5, 7, 10, 4, 9, 15, 14, 2
is
 - a) 9
 - b) 10
 - c) 12
 - d) 4.
 - iii) The range of the values 148, 154, 158, 160, 161, 162,
170, 182, 195, 236 is
 - a) 45
 - b) 88
 - c) 148
 - d) 236.



- x) The lines of regression concerning the variables x and y are given by $y = 32 - x$ and $x = 13 - 0.25y$. The values of the means are
- a) 6.7 and 25.3 b) 4.2 and 9.7
 c) 7.9 and 24.8 d) none of these.
- xi) The first and third quartile from the following data :
 2, 5, 7, 10, 4, 9, 14
 is
- a) 5, 12 b) 7, 9
 c) 5, 10 d) none of these.
- xii) If each item is reduced by 15 then A.M. is
- a) reduced by 15 b) increased by 15
 c) reduced by 10 d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. Find correlation coefficient from the following data :
 $X: 5 \quad 7 \quad 11 \quad 13 \quad 15$
 $Y: 1.7 \quad 2.4 \quad 2.8 \quad 3.4 \quad 4.4$
3. Compute the missing frequencies. Total frequency 1000 and Median is 413.11.

Class	No. of Students
300 – 325	5
325 – 350	17
350 – 375	80
375 – 400	?
400 – 425	326
425 – 450	?
450 – 475	88
475 – 500	9



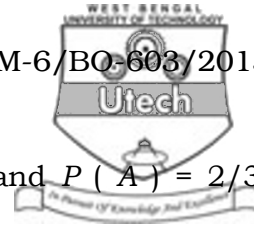
4. There are two branches of a hospital employing 100 and 80 persons respectively. If the arithmetic means of the monthly salaries paid by the two branches are Rs. 275 and Rs. 225 respectively, find the mean salaries of the employees as a whole.
5. Find the mean of x and y from the regression lines
 $2x - y + 3 = 0$ and $4x - 5y + 1 = 0$.
6. Given the regression equations of y on x and x on y are respectively $y = 2x$ and $6x - y = 4$. Find the correlation coefficient between x and y .

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Form a frequency distribution table of eight class intervals from the following data :
- 17, 11, 65, 14, 22, 35, 44, 81, 39, 58, 47, 75, 58, 37, 49, 27, 56, 77, 81, 20, 19, 45, 28, 60, 16, 26, 50, 25, 33, 53, 57, 48, 47, 81, 58, 76, 37, 23, 83, 42, 71, 78, 89, 43, 31, 40, 82, 24, 78, 30.
- i) Also draw cumulative frequency less than type.
- ii) Find frequency density and percentage frequency.



- b) If A and B are independent events and $P(A) = 2/3$, $P(B) = 3/5$. Find $P(A + B)$.

8. a) Calculate the standard deviation of the following distribution of marks obtained by 90 students :

Marks :	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
No. of Studnets :	5	12	15	16	18	14	6	4

- b) Four persons are chosen at random from a group containing 3 men, 2 women and 4 children. Show that the chance that exactly two of them will be children is $12/21$. 8 + 7

9. a) State and prove Baye's Theorem.
- b) A population consists of 4 members 3, 7, 11, 15. Consider all possible samples of size 2 which can be drawn without replacement from the population.

Find :

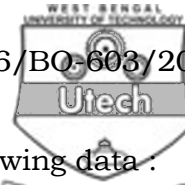
- i) Population mean
- ii) Population S. D.
- iii) Standard error of sample mean.
- c) Three fair coins are tossed. Find the probability of
- i) at least one head
- ii) exactly one tail. 5 + 5 + 5

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10. a) For a group of 50 boys in Optometry Fifth Semester the mean score and the standard deviation of scores on a test are 59.5 and 8.38. For a group of 40 boys in Optometry Sixth Semester the same results are 54 & 8.23. Find the mean and S. D. of combined group of 90 students.
- b) Draw histogram and frequency polygon to present the following data :

Earnings	No. of persons
100 – 149	21
150 – 199	32
200 – 249	52
250 – 299	105
300 – 349	62
350 – 399	43
400 – 449	18
450 – 499	9



11. Find the coefficient of rank correlation of following data :

A series :	115	109	112	87	98	98	120	100	98	118
B series :	75	73	85	70	76	65	82	73	68	80

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