Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/HM/SEM-2/BHM-202/2010

2010

BIO-STATISTICS – I

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 : $10 \times 1 = 10$

   i) Which of the following is not a measure of central tendency ?

   a) Mean b) Median

   c) Average deviation d) Mode.

   ii) When a distribution is asymmetrical and has 1 mode, the highest point on the curve is called

   a) range b) mean

   c) median d) mode.

iii) The mean and standard deviation of a standard normal deviation is respectively

a) 1, 1 b) 0, 0

c) 1, 0 d) 0, 1.

iv) Range of the following data : 9, 7, 25, 18, 38, 12, 30, 35 is

a) 32 b) 31

c) 34 d) 40.

v) Bio-statistics is concerned with

a) living organism b) non-living organism

c) both (a) & (b) d) none of these.

vi) Bio-statistics is also known as

a) Biology b) Biometry

c) Biotic d) none of these.

vii) The chart in which different categories of data are represented as percentage of 360 degree is called

a) pie diagram b) line diagram

c) ogive d) none of these.

viii) Standard deviation is independent of change of

a) origin b) scale

c) both (a) & (b) d) none of these.

ix) If the mean of 7, $x - 3$, 10, $x + 3$ and $x - 5$ is 15 then the value of x is

a) 20 b) 21

c) 22 d) none of these.

x) The algebraic sum of deviation of observation from their A.M. is

a) minimum b) maximum

c) zero d) none of these.

xi) The normal distribution is a

a) continuous probability distribution

b) discrete probability distribution

c) both (a) & (b)

d) none of these.

xii) Area under standard normal curve between $Z = +1$ and $Z = -1$ is

a) 95·45% b) 68·27%

c) 99·75% d) none of these.

GROUP – B
(Short Answer Type Questions)

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

2. Construct a line diagram for the data set given below :

Year	Number of Students in HM
1995	105
1996	270
1997	478
1998	520
1999	533
2000	764
2001	850

3. The mean monthly salary paid to all employees in a certain company was Rs. 500. The mean monthly salaries paid to male and female employees were Rs. 520 and Rs. 420 respectively. Obtain the percentage of male to female employees in the company.

4. In a cricket match, the average runs made by 11 players were calculated as 40. Later on it was discovered that the score of a player who had actually made 11 runs was read as 22. Find the correct average.

5. Find the standard deviation from the following data :

   49, 63, 46, 59, 65, 52, 60 and 54

6. The mean of a normal distribution is 50 and 5% of the values are greater than 60. Find the standard deviation of the distribution (Given that the area under standard normal curve between $z = 0$ and $z = 1{\cdot}64$ is $0{\cdot}45$)

GROUP – C
(Long Answer Type Questions)

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

7. a) In 1991, a city had a total of 600 thousand live births while its total population was 35216 thousand and total female population in the age group 15-49 l.b.d. was 7800 thousand. Obtain the crude birth rate and general fertility rate. 5

b) Calculate the following from the given data :

i) Crude death rate

ii) Specific Death rate for each age group

iii) Standardized death rate

Age Group	Population	Number of Deaths in a Year	Standard Population (Thousand)
0 - 4	5,000	150	110
5 - 14	7,000	21	210
15 - 34	14,000	63	360
35 - 59	16,000	176	240
60 & above	8,000	320	80

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8. Marks of 50 students in a test are given below :

34	46	48	43	47	30	48	50	45	32
15	10	05	06	25	39	41	47	05	07
11	13	17	21	27	30	31	33	37	38
49	43	41	12	09	21	37	36	48	25
21	20	15	16	08	32	40	41	50	47

a) Arrange the data in frequency distribution in 10 class-intervals. 3

b) Find the class boundaries and class marks. 3

c) Find the cumulative frequency both more than and less than types. 6

d) Obtain the percentage frequency in each class-interval. 3

9. a) The table below gives the diastolic blood pressure of 250 men. The readings were made to the nearest millimetre and the central value of each group is given :

Blood pressure (mm) :	60	65	70	75	80	85	90	95
Number of men :	4	5	31	39	114	30	25	2

Calculate from the data the mean and the median. 7

b) You are given the following incomplete frequency distribution. It is known that the total frequency is 1000 and that the median is 413·11. Estimate by calculation the missing frequencies. 8

Values	300 - 320	325 - 350	350 - 375	375 - 400	400 - 425	425 - 450	450 - 475	475 - 500
Frequency	5	17	80	*A*	326	*B*	88	9

10. a) The monthly profits in rupees of 100 shops are distributed as follows :

Profits per shop	0 - 100	100 - 200	200 - 300	300 - 400	400 - 500	500 - 600
No. of shops	12	18	27	20	17	6

Draw the histogram to the data and hence find the modal value. Check this value by direct calculation. 8

b) Find the standard deviation from the following frequency distribution : 7

Height in inches	No. of students
Over 60 but not more than 62	35
Over 62 " 64	27
Over 64 " 66	20
Over 66 " 68	13
Over 68 " 70	5
	100

11. a) From the data given below, state which series is more variable (Use standard deviation) : 6

Variable	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Series *A*	10	18	32	40	22	18
Series *B*	18	22	40	32	18	10

b) In a sample of 120 workers in a factory, the mean and s.d. of wages were Rs. 11·35 and Rs. 3·03 respectively. Find the percentage of workers getting wages between Rs. 9 and Rs. 17 in the whole factory, assuming that the wages are normally distributed. (Given, area under standard normal curve from $z = 0$ to $z = 0{\cdot}78$ is 0·2823 and to $z = 1{\cdot}86$ is 0·4686) 9