Roll No. .....

BCA–305(N)

B. C. A. (Third Semester)
EXAMINATION, Dec., 2012

(New Course)

Paper Fifth

ELEMENTS OF STATISTICS

Time : Three Hours] [*Maximum Marks : 75*

Note : Section A is compulsory. Attempt any *seven* questions from Section B and *one* question from Section C.

Section – A

(Numerical/Analytical/Problematic Questions)

1. (a) Find the arithmetic mean for the following distribution : 4

Class	Frequency
0 – 10	7
10 – 20	8
20 – 30	20
30 – 40	10
40 – 50	5

(b) Write a short note on scope of Statistics. 4

2. (a) A bag contains 4 black, 3 white and 2 red balls. What is the probability of drawing a black or a red ball ? 4

(b) How many different words can be formed with the letters of the word 'MISSISSIPPI' ? 3

Section – B

(Short Answer Type Questions)

3. In the following table the weights of 40 male students of a State University are recorded to the nearest pond. Construct a frequency distribution : 6

138	164	150	132	144	125	149	157
146	158	140	147	136	148	152	144
168	126	138	176	163	119	154	165
146	173	142	147	135	153	140	135
161	145	135	142	150	156	145	128

4. If ${}^nP_r = {}^nP_{r+1}$ and ${}^nC_r = {}^nC_{r-1}$, find the values of n and r. 6

5. Construct the cumulative frequency distribution (both "less than" and "more than" types) from the following data : 6

Height (in cm)	No. of Students
110 – 119	7
120 – 129	15
130 – 139	30
140 – 149	20
150 – 159	8
Total	80

6. (a) Find the geometric mean of 4, 9, 12, 48. 3

(b) Find the harmonic mean of 4, 8, 16. 3

7. During an examination of equal length, the following number of defects were observed :

2, 3, 4, 0, 5, 6, 7, 4, 3, 2

Draw a control chart for the number of defects and comment whether the process is under control or not. 6

8. Find the mode from the following data : 6

Age	Frequency
0–6	6
6–12	11
12–18	25
18–24	35
24–30	18
30–36	12
36–42	6

9. Calculate the mean and standard deviation from the following data : 6

x	f
6	3
7	6
8	9
9	13
10	8
11	5
12	4

10. Three groups of children contain respectively 3 girls and 1 boy; 2 girls and 2 boys; 1 girl and 3 boys. One child is selected at random from each group. Show that the chance that the three selected consist of 1 girl and 2 boys is 13/32. 6

11. Explain the following with example : 6

(i) Mutually exclusive events

(ii) Independent events

(iii) Conditional probability

12. The mean of 200 items was 50. Later on it was discovered that two items were misread as 92 and 8 instead of 192 and 88. Find the corrected mean. 6

Section – C

(Long Answer Type Questions)

13. Compute the median and standard deviation from the following data : 18

Class Interval	Frequency
0 – 4	4
4 – 8	8
8 – 12	2
12 – 16	1

14. The following data shows the value of sample mean X and the range R for ten samples of size 5 each. Calculate the values for central line and control limits for mean chart and range chart and determine whether the process is in control : 18

Sample No.	Mean $\overline{X}$	Range R
1	11·2	7
2	11·8	4
3	10·6	8
4	11·6	5
5	11·0	7
6	9·6	4
7	10·4	8
8	9·6	4
9	10·6	7
10	10·0	9

(Given for $n = 5$, $A_2 = 0{\cdot}577$, $D_3 = 0$, $D_4 = 2{\cdot}115$).

15. A student must answer 8 out of 10 questions in an examination : 18

(i) How many choices does the student have ?

(ii) How many choices does he have if he must answer the first three questions ?

(iii) How many choices does he have if he must answer at least four of the first five questions ?

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