

Roll No. ....

**BCA-305(N)**

**B. C. A. (Third Semester)  
EXAMINATION, Dec., 2013**

**(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 any one question from Section C.**

**Section—A**

**(Numerical/Analytical/Problematic Questions)**

1. (a) The arithmetic mean of two observations is 25 and the harmonic mean is 9, what is geometric mean of the series ? 4
- (b) Write a short note on scope of Statistics. 4
2. (a) One number is drawn from numbers 30 to 100. Find the probability that it is either divisible by 2 or 5. 4
- (b) The letters of the word "TUESDAY" are arranged in a line each arrangement ending with letters S. How many different arrangements are possible ? How many of them start with letter D ? 4

Section—B  
(Short Answer Type Questions)

3. Find the median from the following frequency distribution : 6

Class	Frequency
3—7	8
7—15	10
15—20	12
20—30	9
30—45	6
45—50	5

4. Prove that :  $P(n, r) = P(n-1, r) + r \cdot P(n-1, r-1)$  6

5. (a) Calculate the harmonic mean of the following values : 3

15, 20, 25, 30, 35, 40

(b) The numbers 2, 4, 6, 8 and 10 have frequencies  $(x+4)$ ,  $(x+3)$ ,  $(x+2)$ ,  $(x+1)$  and  $(x)$  respectively. If the arithmetic means is 5, find the value of  $x$ . 3

6. Find the mode for the following distribution : 6

Class Interval	Frequency
0—10	5
10—20	8
20—30	7
30—40	12
40—50	28
50—60	20
60—70	10
70—80	10

7. Calculate standard deviation and variance for the following data : 6

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

8. In how many ways can a cricket eleven be chosen out of a batch of 16 players if : 6

- (i) there is no restriction the selection.
- (ii) a particular player is always chosen.
- (iii) a particular player is never chosen ?

9. Three group 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 selected consist of 1 girl and 2 boys is  $13/32$ . 6

10. We have the following data on the monthly expenditure of food (in Rupees) for 30 households in a locality : 6

115	159	196	205	212	223
256	271	310	129	335	169
184	234	245	241	265	298
144	135	172	173	229	243
220	238	278	243	220	238

- (i) Obtain a frequency distribution using the following class interval 100—150, 150—200, 200—250, 250—300, 300—350.
- (ii) What percentage of households spends less than ₹ 250 per month and what percentage of households spends more than ₹ 200 per month ?
11. The average marks of 80 students were found to be 40. Later, it was discovered that a score of 54 was misread as 84. Find the corrected mean of the 80 students. 6
12. Find the mean, median and mode for the values : 3, 5, 2, 6, 5, 9, 5, 2, 8, 6 6

## Section—C

## (Long Answer Type Questions)

13. (a) Explain the following with an example : 9
- (i) Mutually exclusive event
- (ii) Independent event
- (iii) Conditional probability
- (b) A and B throw alternately with a pair of ordinary dice. A wins if he throw 6 before B throw 7 and B win if he throw 7 before A wins. Show that A has choice of winning is  $30/61$ . 8
14. Calculate mean and standard deviation for the following table giving the age distribution of 542 members : 17

Age in Years	No. of Members
20—30	3
30—40	61
40—50	132
50—60	153
60—70	140
70—80	51
80—90	2

15. (a) Calculate first (lower) and third (upper) quartile from the following : 10
- | Salary (₹) | No. of Employees |
|------------|------------------|
| 0—10       | 22               |
| 10—20      | 38               |
| 20—30      | 46               |
| 30—40      | 35               |
| 40—50      | 20               |
- (b) If  ${}^n P_r = 120$  and  ${}^n C_r = 20$ , find the value of  $r$ . 7