

E 7831

(Pages : 3)

Reg. No.....

Name.....

**B.C.A. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2017**

**First Semester**

Complementary Course—BASIC STATISTICS

(2013–2016 Admissions)

Time : Three Hours

Maximum Marks : 80

**Part A (Short Answer Questions)**

*Answer all questions.*

*Each question carries 1 mark.*

1. What is Primary data ?
2. Define Questionnaire.
3. What is random sampling ?
4. Define Statistical average.
5. Mention any *one* demerit of mode.
6. What is random experiment ?
7. Define event.
8. What is sample space ?
9. Define distribution function.
10. Give any *one* use of M.G.F.

(10 × 1 = 10)

**Part B (Brief Answer Questions)**

*Answer any eight questions.*

*Each question carries 2 marks.*

11. Distinguish between population and sample.
12. How will you construct frequency curve ?
13. Write any *two* objectives of frequency distribution.
14. Give a situation where median is regarded as a suitable average.
15. Explain dispersion.
16. Find mean deviation of the values 7, 3, 8, 10, 4, -2 from the mean.

Turn over

17. State addition theorem in probability and deduce the case for three events.
18. A card is drawn from a pack of cards. What is the probability that it is (a) Jack or spade ; (b) Jack and spade.
19. What are the properties of p.d.f. ?
20. What is Mathematical expectation ? List out its properties.
21. State and prove additive property of M.G.F.
22. What are the uses of moments ?

(8 × 2 = 16)

### Part C (Descriptive/Short Essay Type Questions)

Answer any six questions.

Each question carries 4 marks.

23. State the general rules of forming a frequency table.
24. Describe the importance of diagrams and graphs in representing a data. Point out its limitations.
25. Find the first four moments about zero of the values 7, 3, 0, 8, 1 and 5 and hence find the first four central moments.
26. Find the root mean square deviation of the following data from the value 5 :
 

Class	: 0-4	4-8	8-12	12-16	16-20
Frequency :	4	9	26	14	7
27. State and prove Baye's theorem.
28. Three identical boxes contains 3 balls each. The first box has all white the second has all black, the third box has one white and 2 black balls. A box is chosen at random and a ball is drawn from it. It is found to be white. Find the probability that the 2nd box was selected.
29. A coin is known to come up heads three times as often as tails. This coin is tossed four times. Write the probability distribution of number of heads appear.
30. Find K if  $f(x) = \begin{cases} Kx(1-x); & 0 < x < 1 \\ 0 & \text{elsewhere.} \end{cases}$  is a p.d.f. Find its mean and variance.
31. Find the m.g.f. of the distribution  $f(x) = pq^x \cdot x^{-1}$ ;  $x = 1, 2, 3, \dots$  and hence evaluate its mean and variance.

(6 × 4 = 24)

### Part D (Long/Essay Type Questions)

Answer any two questions.

Each question carries 15 marks.

32. Represent the following data by an Ogive :
 

Monthly Income Below :	5,000	10,000	15,000	20,000	25,000	30,000	35,000	40,000
No. of families	38	138	246	368	512	600	632	650
33. Estimate the percentage of families getting (i) above 33,000 ; (ii) between 18,000 and 29,000. Compare it with the standard deviation.
34. (a) Explain 'a priori probabilities' and 'a posteriori probabilities'.  
(b) If A and B are independent prove that (i)  $A^c$  and  $B^c$  ; (ii) A and  $B^c$  ; (iii)  $A^c$  and B are also independent.
35. X be a random variable with p.d.f. :

$$f(x) = \begin{cases} kx^2; & 0 < x < 1 \\ kx; & 1 < x < 2 \\ 0; & \text{elsewhere.} \end{cases}$$

Find (i) K ; (ii) the m.g.f. of X ; (iii)  $P(0.5 < X < 1.5)$  ; (iv) variance of X

(2 × 15 = 30)