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Reg. No..... 40

Name.....

B.C.A. DEGREE (CBCS) EXAMINATION, JANUARY/FEBRUARY 2018

First Semester

Complementary Course—BASIC STATISTICS AND INTRODUCTORY PROBABILITY THEORY

(Only for B.C.A.)

[2017 Admissions]

Time : Three Hours

Maximum Marks : 80

Part A

*Answer any two questions.
Each question carries 2 marks.*

1. Define average.
2. If mean = 25, mode = 30, what is median ?
3. What are quartiles ?
4. Define correlation.
5. What is curve fitting ?
6. What would be your interpretation of the correlation is 1 and -1 ?
7. Define random experiment with an example.
8. What is classical definition of probability ?
9. Define conditional probability.
10. Define random variable.
11. If $V(X) = 2$, find $V(2X + 5)$.
12. A random variable X has $E(X) = 2$, $E(X^2) = 8$. Find $V(X)$.

(10 × 2 = 20)

Part B

*Answer any six questions.
Each question carries 5 marks.*

13. What are the desirable properties of a good average ?
14. What is a box plot ?
15. Find mean deviation about mean :

11, 3, 0, 7, 2, 6, 4, 7

Turn over

16. Distinguish between correlation and regression.
17. Explain the principle of least squares.
18. State and prove addition theorem for two events.
19. Three men working Independently attempt to decode a secret message. If their individual probabilities of success are 0.2, 0.4 and 0.5, What is the probability that the message is decoded?
20. An unbiased die is thrown. Sketch the graph of its mass function and distribution function.
21. A random variable X has the density function :

$$f(x) = \frac{c}{(1+x^2)}; -\infty < x < \infty.$$

Find the value of the constant c.

(6 × 5 = 30)

Part C

*Answer any two questions.
Each question carries 15 marks.*

22. Calculate the coefficient of correlation from the following data :

Roll No.	:	1	2	3	4	5	6	7	8	9	10
Marks in Maths	:	45	56	39	54	45	40	56	60	30	35
Marks in Law	:	40	56	30	44	36	32	45	42	20	36

23. State and Prove Baye's theorem.
24. A random variable X has the following probability function :

$$\begin{aligned} f(x) &= k && \text{for } x = 0 \\ &= 2k && \text{for } x = 1 \\ &= 3k && \text{for } x = 2 \\ &= 0 && \text{otherwise} \end{aligned}$$

- (a) Determine the value of k. (5)
- (b) Find $P(X < 2)$, $P(X \leq 2)$. (5)
- (c) Write down the distribution function of X. (5)
25. Find the mean, variance and moment generating function of :

$$f(x) = \begin{cases} a e^{-ax} & ; x > 0, a > 0 \\ 0 & ; \text{otherwise} \end{cases}$$

[2 × 15 = 30]