D 43234 (Pages : 3) Name..................................

Reg. No..............................

SECOND SEMESTER B.C.A. DEGREE EXAMINATION, MAY 2018

(CUCBCSS–UG)

Complementary Course

BCA 2C 03—COMPUTER ORIENTED STATISTICAL METHODS

(2014—2016 Admissions)

Time : Three Hours Maximum : 80 Marks

Section A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. The mean of a set of observations is zero, then the variance is :
   - (a) 0.
   - (b) 1.
   - (c) Mean squares of observations.
   - (d) Sum of squares of observations.
2. Which of the following is least affected by extreme values :
   - (a) A.M.
   - (b) Median.
   - (c) G.M.
   - (d) H.M.
3. If A and B are two mutually exclusive events, then :
   - (a) $P(A \cap B) = P(A) + P(B)$.
   - (b) $P(A \cap B) = P(A)\,P(B)$.
   - (c) $P(A \cap B) = 0$.
   - (d) $P(A \cap B) = 1$.
4. The sum of squares of n independent standard normal variables follows :
   - (a) t-distribution.
   - (b) χ^2-distribution.
   - (c) F-distribution.
   - (d) Normal distribution.
5. The power of test is the probability of :
   - (a) Type I error.
   - (b) Type II error.
   - (c) Not committing an error.
   - (d) None of the above.
6. The range of correlation coefficient is ————.
7. The sum of squares of deviations is minimum when the deviations are taken from ————.
8. If $P(A) = 0.4$, then $P(A^c) =$ ————.
9. If X_1 and X_2 are two independent standard normal variables, then the ratio of their squares follows ———— distribution.
10. The standard deviation of a binomial distribution with $n = 10$ and $p = 0.4$ is ————.

(10 × 1 = 10 marks)

Turn over

Section B

Answer **all** *questions.*
Each question carries 2 marks.

11. State principle of least squares.
12. Give frequency definition of probability by stating statistical regularity.
13. Define moment generating function. Express it in terms of moments.
14. Distinguish between Statistic and parameter. Give an example for each.
15. Define power of a test and level of significance.

(5 × 2 = 10 marks)

Section C

Answer any **five** *questions.*
Each question carries 4 marks.

16. Find the AM and Median of the following data :

Class :	0—10	10—20	20—30	30—40	40—50	50—60
Frequency :	8	12	15	12	8	5

17. Find the Spearman's rank correlation of the following ranks :

Rank 1 :	1	2	3	4	5	6	7	8	9	10
Rank 2 :	1	3	2	4	7	6	5	8	8	10

18. Fit the line Y = A + BX to the following data :

X :	1	2	3	4	5	6	7	8	9	10
Y :	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5

19. Find the mean and variance of the following distribution :

X :	0	1	2	3	4	5	6	7
p :	.005	.005	.01	.03	.03	.01	.005	.005

20. Derive the m.g.f. of Poisson distribution. Hence find its mean and variance.
21. Write the relation between t, χ^2 and F distributions.
22. Distinguish between point estimate and interval estimate. Write the 95 % confidence interval for the proportion of binomial population.
23. (a) Define maximum likelihood estimator.

    (b) State Neymann Pearson approach.

(5 × 4 = 20 marks)

Section D

Answer any **five** *questions.*
Each question carries 8 *marks.*

24. Fit the polynomial $Y = A + BX + CX^2$ to the following data :

X	:	–2	–1	0	1	2	3	4	5	6	7
Y	:	2	1.5	2	3.5	6	9.5	14	19.5	26	33.5

25. Find the coefficient of correlation for the following data :

X	:	2	5	3	3.5	4	8	6	6.5	5	7
Y	:	3	1.5	4	7	7	9	12	11	9	10

26. If $f(x, y) = \frac{2}{3}(1+x)\, e^{-y}, 0 < x, 1, 0 < y < \infty,$ find the marginal distribution of X and Y.

27. A random sample of size 100 is taken from a normal distribution with mean 80 and standard deviation 50. Find (a) $P(\overline{X} < 85)$; (b) $P(70 < \overline{X} < 85)$; (c) $P(\overline{X} > 90)$.

28. Suppose a telephone exchange receives telephone calls at the rate of 3 calls per minute on an average. Then find the probability of receiving (i) at most one call in one minute ; (ii) at least one call in one minute.

29. A random sample of 100 male students from a college having mean 67.45 inches and standard deviation 2.93 inches. Find 95 % and 99 % confidence intervals for the true mean height.

30. Explain the desirable properties of a point estimate. Give examples.

31. A box contains 8 red, 3 white and 9 blue balls. If 3 balls are drawn at random, determine the probability that (a) all 3 are red ; (b) all 3 are white ; (c) 2 are red and one is white ; (d) atleast one is white.

(5 × 8 = 40 marks)