15U230 (Pages: 2) Name.....

Reg. No.....

SECOND SEMESTER B.C.A. DEGREE EXTERNAL EXAMINATION, JUNE 2016

(CUCBSS - UG)

Complementary Course

BCA2C03- COMPUTER ORIENTED STATISTICAL METHODS

(2015 Admission)

Time: Three Hours **Maximum Marks: 80**

Part A

Answer ***all*** questions.

1. When there are negative observations in the data, we cannot use
   a) mean b) median c) mode d) geometric mean.
2. Kurtosis is a measure of
   a) central tendency b) symmetry c) dispersion d) flatness
3. If A and B are events which have no points in common, then the events A and B are
   a) mutually exclusive b) equally likely c) independent d) dependent.
4. $E(e^{itx})$ is known as
   a) moment generating function b) p.m.f c) characheristic function d) p.d.f
5. The square of a t variate with n d.f is
   a) a t^2 variate with n d.f b) a t variate with n^2 d.f. c) F variate with (1, n) d.f
   d) F variate with (n,1) d.f.
6. For a mesokurtic distribution 4^{th} central moment is 243. Then the S.D of the distribution is
   a) 3 b) 6 c) 9 d) $\sqrt{3}$
7. An unbiased coin is tossed n times. If X is the number of heads turning up, the distribution
   a) binomial b) Poisson c) exponential d) geometric.
8. The range of simple correlation coefficient is
   a) -1 and +1 b) 0 and 1 c) 0 and ∞ d) none of the above.
9. The ML estimates are
   a) asymptotically unbiased b) consistent c) efficient d) all the above
10. Size of critical region is known as
    a) power of the test b) type II error c) admissible test d) none of the above

(10 * 1 = 10 marks)

Part B

Answer ***all*** questions.

11. Give the classical definition of probability. Mention an advantage of the definition.
12. Define mathematical expectation and moment generating function of a random variable.
13. Define unbiasedness and consistency of estimators.
14. Define sampling distribution and standard error of a statistic.
15. Define mean deviation and standard deviation

(5 * 2 = 10 marks)

Part C

Answer any ***five*** questions.

16. What are the desirable properties of a good measure of central tendency? Why A.M. is considered as the best measure?
17. The mean of a binomial distribution is 4 and variance is 2. Find P(X=0), and the middle term or terms.
18. State and prove the addition theorem in probability for two events.
19. State and prove the relationship between r th raw and central moments.
20. Define F and χ^2 distributions.
21. A random variable X has the following probability function.

X	1	2	3	4
P(X=x)	15/61	10/61	30/61	6/61

Find the distribution function of X and P(X≥ 3/X≥2).

22. Define a bivariate p.m.f. Define marginal and conditional p.m.fs.
23. What is meant by interval estimation? What is meant by 95% confidence interval?

(5 * 4 = 20 marks)

Part D

Answer any ***five*** questions

24. Define a binomial distribution. Obtain the m.g.f and hence establish the additive property.
25. Two unbiased dice are thrown. If X is the number on the first die and Y is the maximum of numbers shown by the two dice, find the joint p.d.f of X and Y. Also examine whether X and Y are independent.
26. For the following data, calculate Karl Pearson's coefficient of correlation.

X	10	15	20	25	30	35	40	45	50
Y	60	64	62	65	66	67	67	65	69

27. State and prove Baye's theorem
28. Derive the 95% confidence interval for the mean and variance of normal population.
29. In random sampling from normal population $N(\mu,\sigma^2)$, find the MLE for
i) μ when σ^2 is known
ii) σ^2 when μ is known .
30. Explain Principle of least squares? How do you fit a parabola to a given data?
31. The skulls are classified as A,B,C according as the length-breadth index is under 75, between 75 and 80 , over 80. If their distribution is assumed to be normal, find the mean and S.D. of a series in which A are 58%, B are 38% and C are 4%.

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(5 * 8 = 40 marks)

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