davv bca question papers

June 2016
Bachelor of Computer Application (BCA) Examination
II Semester

Statistics - II

Time 3 Hours]   [Max. Marks 40

Note : *Attempt all the five questions. All questions carry equal marks.*

1. State and prove Cramer Rao inequality, mentioning the regularity conditions what is the importance of this inequality?

    OR

    For a random sample of size n from a normal distribution with mean θ and variance σ^2 (N (θ, σ^2)) :

    (a) Find the maximum likelihood estimator $\hat{\theta}$ of θ and state giving reasons whether $\hat{\theta}$ is a consistent estimator of θ.

    (b) Obtain the maximum likelihood estimator $\hat{\sigma}^2$ of σ^2 when θ is unknown. State giving reasons if $\hat{\sigma}^2$ is unbiased estimator of σ^2.

2. What is test of a statistical hypothesis? use Neymann-Pearson lemma to obtain BCR for testing $\theta = \theta_0$ against (a) $\theta = \theta_1 > \theta_0$ (b) $\theta = \theta_1 < \theta_0$ for a random sample of size n from a N $(\theta, 4)$ Population.

    OR

    Explain the terms 'simple hypothesis' and 'composite hypothesis'. Let p be the probability that a coin will fall head up in a single toss in order to test $H_0 : p = 1/2$ against $H_1 : p = 3/4$ the coin is tossed 5 times and H_0 os rejected if more than 3 heads are obtained Find the prebabilities of type I error and type II error.

3. Define t-distribution Explain the t-tests for (a) single mean (b) paired-sample means (c) difference of means of two indepenent samples clarly stating the situations when these tests are used and how conclusions can be drawn for one tailed and two tailed tests.

    OR

    Wrote short notes on Beta distributions.

4. Describe the following non-parametric tests:
    (a) Run test   (b) Median test
    Explain how run test can be used to test for randomness.

    OR

    Explain when and how to use the non parametric tests: (a) Sign test

(b) Wilcoxon's sogmed rank test, State the relative advantages and disadvantages of these two tests.

5. What is the basic concept of "Analysis of Variance' of data sets? Discuss the analysis of vatiance for two way classification with one observation per cell.

OR

Wheight gains of 20 chicks fed on four different feeds A,B,C,D are provided in the following table, where eah feeding treatment is given to five randomly chosen chicks. Apply ANOVA to analyse the data stating clearly the hypotheses and conclusions ($F_{.05, (3, 16)} = 3.06$)

Chick No. → Feed ↓	1	2	3	4	5
A	55	49	42	21	52
B	61	112	30	89	154
C	42	97	81	95	92
D	169	137	169	85	154

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