

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

THIRD YEAR

B.A./B.SC. FIFTH SEMESTER (July – December), 2012

Mid-Semester Examination, September 2012

Date : 10/09/2012

ECONOMICS (Honours)

Time : 2 pm – 4 pm

Paper : V

Full Marks : 50

[Use Separate Answer Script for each Group]

Group – A

Answer **any five** questions :

[5×5]

1. Let X and Y have joint probability density function

$$f(x, y) = 2, 0 < x < y < 1 \\ = 0, \text{ otherwise}$$

Find the conditional mean and variance of X given Y = y.

2. Obtain the rank correlation coefficient for the following data :

X :	68	64	75	50	64	80	75	40	75	64
Y :	62	60	68	45	81	60	68	48	65	70

3. Let $U = X \cos \alpha + Y \sin \alpha$ and $V = Y \cos \alpha - X \sin \alpha$ Show that U and V will be uncorrelated if

$$\tan 2\alpha = \frac{2r\sigma_X\sigma_Y}{\sigma_X^2 - \sigma_Y^2} \text{ where } r = r_{XY}.$$

4. T_1 and T_2 are two independent unbiased estimators of θ with variances 4 and 9 respectively. Let $T = \ell_1 T_1 + \ell_2 T_2$ where ℓ_1, ℓ_2 are arbitrary constant. Find the value of ℓ_1 and ℓ_2 such that T is unbiased for θ and has the minimum variance for all possible values of ℓ_1 and ℓ_2 .

5. Find the MLE of p from a random sample of size k from a Binomial distribution with parameter n and p.

6. Define the terms—
i) Level of Significance
ii) Power of a test
iii) Alternative hypothesis with example

7. Let p be the probability that a coin will fall head in a single toss in order to test $H_0 : p = \frac{1}{2}$ vs.

$H_1 : p = \frac{3}{4}$. The coin is tossed 5 times and H_0 is rejected if more than 3 heads are obtained. Find the probability of type I error and power of the test.

8. Measures of contents from 300 ml bottles are given by

299.7, 298.1, 298.8, 297.6, 301.1, 297.1, 299.3, 301.5, 300.4, 298.3

Assuming that the content of the bottles are distributed normally with a standard deviation of 3.5 ml, test at 5% that the average content is less than 300 ml. Given $Z_{.05} = 1.645$.

Group – B

9. Write short notes on **any three** of the following :

[3×5]

- Policy of 'controlled expansion'
- Problem of NPA in the Indian banking sector
- Changing composition of exports in India in the post-reform period

- d) Import-substitution in India
- e) Trend of non-developmental expenditure in India

10. Answer **any one** of the following questions :

[10]

- a) Discuss the major features of the EXIM Policy of India in the Post-reform period.
- b) Discuss briefly the reform in the insurance sector of India in the recent years.

