RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.SC. FIFTH SEMESTER EXAMINATION, DECEMBER 2012

THIRD YEAR

Date : 15/12/2012 **Economics (Honours)**

Time : 10.30 am – 2.30 pm Paper : V Full Marks : 100

(<u>Use separate answer book for each group</u>)
<u>Group – A</u>

1. Answer **any four** questions of the following: [4×5]

   a) Is the following a joint probability function? If so, examine whether the variables are independent or not.

   $$h(x, y) = \begin{cases} \dfrac{2}{3}(x+1)e^{-y}, 0 < x < 1, y > 0 \\ \\ 0, \text{ else where.} \end{cases}$$

   (2+3)

   b) i) If X has the binomial distribution with parameters n and p, show that $\dfrac{x+\sqrt{n}/2}{n+\sqrt{n}}$ is unbiased for p iff $p = \dfrac{1}{2}$. (3)

   ii) Show that if $\hat{\theta}$ is unbiased for θ and Var $(\hat{\theta}) \neq 0$, $\hat{\theta}^2$ is biased for θ^2. (2)

   c) Elucidate the concepts of Type I error, Type II error and power of a test. (2+2+1)

   d) Derive the relation $r^2 = \dfrac{t^2}{t^2+n-2}$. (5)

   e) If three uncorrelated variables x_1, x_2, x_3 have the same standard deviation, find the coefficient of correlation between $x_1 + x_2$ and $x_2 + x_3$. (5)

   f) Explain the construction of D-W statistic and its approximate relation with the value of autocorrelation of first order. (3+2)

   g) How can you explain the problem of heteroscedasticity in the CLRM? What are the consequences of applying OLS method of estimating parameters in this case? (2+3)

2. Answer **any two** questions of the following: [2×15]

   a) i) Obtain the expression for standard error of sample mean for a random sample of size n drawn from a population of N with replacements. How does the value of standard error change when the same exercise is repeated for SRSWOR? (4+5)

   ii) Derive the expression for maximum likelihood estimator of the parameters in a $N(\mu, \sigma^2)$ population, where the notations have their usual meanings. (6)

   b) i) Three fair coins are tossed simultaneously. Let X denotes the number of heads and Y denotes the absolute difference between the number of heads and tails. Find the joint distribution of (X,Y). Are X,Y independent? (5+3)

   ii) Show that Spearman's rank correlation coefficient can be expressed as a usual product-moment correlation coefficient. (4)

   iii) Show that $|r_{XY}| \leq 1$. (3)

   c) Consider the following estimated regression equation :

   $Yi = 3.6 + \hat{\beta}X_i + u_i$, i=1,2,....,10

   $\Sigma X_i = 80$, $\Sigma Y_i = 96$, $\Sigma X_i^2 = 668$, $\Sigma Y_i^2 = 952$, $\Sigma X_i Y_i = 789$

   i) Compute $\hat{\beta}$. (2)

   ii) Obtain the coefficient of simple correlation between X and Y. (2)

iii) Calculate the estimated error variance and then the estimated standard error of $\hat{\beta}$. (3+2)

iv) Construct a 95% confidence interval for β. (3)

v) Test, at 5% level of significance, the hypothesis that X and Y are positively correlated. (3)

$$\begin{bmatrix} \text{Given that } t_{0.05,8} = 1.860 \\ \text{And } t_{0.025,8} = 2.306 \end{bmatrix}$$

d) i) Obtain the trend values for the following series by fitting a second-degree polynomial. (6+2)
Estimate the value for the year 1972-73.

Gross Earnings by Indian Railways During 1964-65 to 1970-71.

Year	Gross Earnings (Rs. Crores)
1964-65	666
1965-66	748
1966-67	777
1967-68	823
1968-69	903
1969-70	957
1970-71	1,010

ii) Define Standardised death rate and total fertility rate. (2+2)

iii) Explain the functions appear in a life table. (3)

Group – B

3. Answer **any three** questions : [3×4]
   a) What do you mean by the policy of ''Controlled expansion'' of RBI?
   b) What is non performing asset in the context of commercial banks in India?
   c) Mention the major economic impacts of ''Operation Barga'' in West Bengal.
   d) What do you mean by currency convertibility? Clearly distinguish between the meaning of partial and full convertibility of Indian rupee.
   e) Distinguish between FII and FDI. Which of those is more beneficial for a country like India?

4. Answer **any one** question : [1×8]
   a) Discuss the changes in the cropping pattern in the agricultural sector of West Bengal in recent years.
   b) Briefly discuss the problem of sick and closed industries in West Bengal.

5. Answer **any two** questions : [2×15]
   a) Discuss the major changes in the direct tax structure in the post reform period. How far have these changes, in your opinion been effective in rectifying the imbalance between direct and indirect taxes in the country? (10+5)
   b) Discuss some of the basic features of the export-import policy of Govt of India in recent years. Comment in this context on the role of FDI in the Indian economy. (9+6)
   c) ''From nationalisation to reform the transformation of Indian commercial banking was quite logical''. Do you a gree with the statement? Does reform signify any betterment of performance of the commercial banks in India? (10+5)
   d) Mention the factors responsible for deceleration in agricultural output in most of the agricultural states in India since early 1990's. In this context compare the growth of agricultural sector in West Bengal with those in some other states in India during recent times. (7+8)

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