**TDC Even Semester Exam., 2019**

ECONOMICS

( Honours )

**( 6th Semester )**

Course No. : ECOH–602

*Full Marks* : 50
*Pass Marks* : 17

*Time* : 2 hours

*The figures in the margin indicate full marks for the questions*

Candidates have to answer *either* Option—A *or* Option—B

OPTION—A

( For Science Students )

Course No. : ECOH–602(Sc)

**( ELEMENTS OF ECONOMETRICS—II )**

Answer **five** questions, taking **one** from each Unit

UNIT—I

**1.** *(a)* State with reason whether the following statements are True, False or Uncertain : 2+2=4

*(i)* OLS estimators are best linear unbiased estimators even in the presence of multicollinearity.





*(ii)* Multicollinearity is harmless if the objective of the analysis is prediction only.

*(b)* Discuss the important factors responsible for the presence of multi-collinearity in a regression model. 6

**2.** *(a)* State with reason whether the following statements are True or False : 2+2=4

*(i)* Perfect multicollinearity creates more serious problems in relation to less than perfect multicollinearity.

*(ii)* A high value of simple correlation coefficient between two explanatory variables in a three-variable linear regression model usually implies a high degree of multicollinearity present in the model.

*(b)* Describe any two remedial measures of multicollinearity. 3+3=6

UNIT—II

**3.** *(a)* State with brief reason whether the following statements are True, False or Uncertain : 2+2=4

*(i)* In the presence of heteroscedasticity, OLS estimators are biased as well as inefficient.

*(ii)* If heteroscedasticity is present, then the conventional *t* and *F* tests are invalid.

*(b)* How can one detect the problem of heteroscedasticity? Discuss elaborately. 6

**4.** *(a)* How does presence of heteroscedasticity create problem in the estimation of a regression model with the help of OLS method? Discuss with illustration. 5

*(b)* State some remedial measures of heteroscedasticity. 5

UNIT—III

**5.** *(a)* Distinguish between quantitative variable and qualitative variable. 2

*(b)* How can econometrics be applied for the analysis of qualitative variables in economics? Discuss elaborately with the help of suitable examples. 8

**6.** Define the following terms : 2×5=10

*(a)* Dummy variable

*(b)* Slope dummy

*(c)* Dummy independent variables

*(d)* Dummy variable trap

*(e)* Interaction effect





UNIT—IV

**7.** Define time series. Compare and contrast between seasonal variations and cyclical variations with the help of suitable examples. 2+8=10

**8.** Discuss different types of trends those are usually observed in time series data. 10

UNIT—V

**9.** Explain the measurement of trend by least squares method. 10

**10.** *(a)* Using three yearly moving averages, obtain the trend values for the following data : 6

| *Year* | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|
| *Production* | 68 | 62 | 61 | 63 | 65 | 68 | 63 |

*(b)* State the advantages of moving average method. 4

OPTION—B

( For Arts Students )

Course No. : ECOH–602(Arts)

**( STATISTICS FOR ECONOMICS—II )**

Answer **five** questions, selecting **one** from each Unit

UNIT—I

**1.** *(a)* What is meant by an index number? State the uses of index numbers. 1+3=4

*(b)* Examine whether Fisher's index number formula satisfies the time-reversal test and factor-reversal test. 6

**2.** *(a)* What is cost of living index number? Describe the steps for its construction. 1+5=6

*(b)* Calculate the price index number by Fisher's ideal formula : 4

| | 2010 | | 2018 | |
|---|---|---|---|---|
| *Commodity* | *Price* (₹) | *Quantity* (kg) | *Price* (₹) | *Quantity* (kg) |
| *A* | 20 | 8 | 40 | 6 |
| *B* | 50 | 10 | 60 | 5 |
| *C* | 40 | 15 | 50 | 10 |
| *D* | 20 | 20 | 20 | 15 |





UNIT—II

**3.** What do you mean by time series? Describe the various components of time series. 2+8=10

**4.** *(a)* Describe the method of moving average in isolating secular trend in time series. 4

*(b)* Fit a straight line trend by the least squares method to the following figures of production of a sugar factory :

| *Year* | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|
| *Production* ('000 tons) | 76 | 87 | 95 | 81 | 91 | 96 | 90 |

Also estimate the production for 1976. 5+1=6

UNIT—III

**5.** *(a)* What is sample survey? Mention some merits of sample survey. 2+2=4

*(b)* Distinguish between simple random sampling with replacement (SRSWR) and simple random sampling without replacement (SRSWOR). 3

*(c)* Write a short note on purposive sampling. 3

**6.** *(a)* Distinguish between (with examples) : 3+3=6

*(i)* Population and Sample

*(ii)* Statistic and Parameter

*(b)* Write a note on multistage sampling. 4

UNIT—IV

**7.** *(a)* Explain the concept of sampling distribution of a statistic. 4

*(b)* A random sample of 100 ball bearings selected from a shipment of 2000 ball bearings has an average diameter of 0·354 inch with an SD = 0·048 inch. Find 95% confidence interval for the average diameter of these 2000 ball bearings. 6

**8.** What is a point estimate? Explain the important criteria of a good estimator. 2+8=10

UNIT—V

**9.** *(a)* Define the following terms : 2×3=6

*(i)* Null hypothesis

*(ii)* Critical region

*(iii)* Level of significance





*(b)* The mean life of a sample of 100 electric bulbs produced by a company is found to be 1570 hours with an SD of 120 hours. If is the mean lifetime of all the bulbs produced by the company, test the hypothesis 1600 hours against the alternative hypothesis 1600 hours, using a level of significance of 0 05. 4

**10.** *(a)* Mention the characteristics of normal distribution. 4

*(b)* A fertilizer mixing machine is set to give 12 kg of nitrate for every quintal bag of fertilizer. Then 100 kg bags are examined. The percentages of nitrate are 11, 14, 13, 12, 13, 12, 13, 14, 11, 12. Is there reason to believe that the machine is defective? Value of $t$ for 9 d.f. is 2·262. 6

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