Register Number:

DATE:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27

M.A. ECONOMICS – III SEMESTER
SEMESTER EXAMINATION: OCTOBER 2019
EC 9418: BASIC ECONOMETRICS

Time-2 ½ hrs **Max Marks-70**

This paper contains TWO printed pages and THREE parts

PART A Answer any five of the following **2 X5=10**

1. The fitted regression equation is given as Y = - 12 + 0.5X. What is the value of the residual at X =50 and Y = 70?
2. What is the rationale for introducing the adjusted R^2 in regression model?
3. What is dummy variable trap?
4. State the need for a Durbin H test.
5. Explain the difference between linearity in variables and linearity in parameters with suitable examples.
6. Mention the different kinds of specification errors that may arise in a regression analysis.
7. Are the following models linear regression models? If not, is it possible to convert them into linear model by suitable algebraic manipulation? Explain
   a) $Y = e^{\beta_1+\beta_2 X_i+u_i}$ b) $Y = \beta_1 + \beta_2 X_i^2 + u_i$

PART B Answer any THREE of the following **10 X3 = 30**

8. State and explain the assumptions of the Classical Linear Regression Model (CLRM). Suppose that ***u*** is independent of the explanatory variables, and it takes on the values ***-2, -1, 0, 1, 2*** with equal probability of ***1/5.*** Does this violate the Gauss-Markov assumptions? Does this violate the CLRM assumptions?
9. Prove that OLS estimators are best linear unbiased estimators.
10. What is testing of hypothesis? Explain the use of F test and t test in multiple regression analysis.
11. A researcher is fitting earnings function susing a sample of data relating to individuals born in the same week in 1958.He decides to relate Y, gross hourly earnings in 2001, to S, years of schooling, and PWE, potential work experience, using the semilogarithmic specication:
    Log Y = 1 + 2S + 3PWE + u

where u is a disturbance term assumed to satisfy the regression model assumptions. PWE is defined as age-years of schooling - 5.Since the respondents were all aged 43 in 2001, this becomes: PWE = 43 - S - 5= 38 - S.

The researcher finds that it is impossible to fit the model as specified. Stata output for his regression is reproduced below:

```
. reg LGY S PWE

      Source |       SS       df       MS              Number of obs =    5660
-------------+------------------------------           F(  1,  5658) = 1232.62
       Model |  237.170265     1  237.170265           Prob > F      =  0.0000
    Residual |  1088.66373  5658  .192411405           R-squared     =  0.1789
-------------+------------------------------           Adj R-squared =  0.1787
       Total |   1325.834  5659  .234287682           Root MSE      =  .43865

------------------------------------------------------------------------------
         LGY |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
           S |   .1038011   .0029566    35.11   0.000     .0980051    .1095971
         PWE |  (dropped)
       _cons |   .5000033   .0373785    13.38   0.000     .4267271    .5732795
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Explain why the researcher was unable to fit his specification. Explain how the coefficientof S might be interpreted.

12. Consider the following functional form: $Y = \beta e^{\lambda x}$. How can you convert this into a model that is linear in parameters? Explain how will you interprete λ in this model when a) λ is small b) when λ is large.

PART C Answer any TWO of the following **15 X2=30**

13. (i) Give the reasons that lead to heteroscedasticity. (ii) What is the remedial measure for heteroscedasticity when the error variance (σ_i^2) is known? Briefly explain. (iii) The error variance (σ_i^2) is not known, but you suspect that it is proportional to X. What is the remedial measure for heteroscedasticity in such context?
14. What is the consequence of less than perfect multicollinearity? What is Variance-Inflating Factor (VIF)? How is the Variance-Inflating Factor used to detect multicollinearity? Explain how transformation of variables can sometimes address the problem of multicollinearity. Give two examples of possible transformations.
15. What are the consequences of using ordinary least squares in presence of autocorrelation? Explain the Durbin-Watson test to detect autocorrelation. What is the remedial measure for first order autocorrelation?