# M.A. Examination, 2015
## Semester-II
## Economics
### Paper – VI
### (Computer Application)

**Time: 3 Hours** **Full Marks: 40**

*Questions are of value as indicated in the margin.*

Answer ***any four*** questions.

1. (a) There are some rules to be followed for data entry in a spreadsheet (say, MS_Excel) from a set of completed survey questionnaire. State the rules with examples.

   (b) Format an Excel sheet for entry of the following information which is a part of a rural Household Survey questionnaire:

   1. Household structure type (put √):
      *1. Fully concrete 2. Partly concrete 3. No concrete*
   2. Sources of water for the HH (all purposes) (put √):
      *1. Private well 2.Common tube well 3.Private pond 4.Village pond 5. Any other*
   3. Main Source of Light (put √):
      *1.Electricity 2.Kerosene 3.Solar unit 4. Other*
   4. Monthly HH regular expenditure on all items: (Rs.) _____ 6+4

2. (a) In an Excel sheet, suppose columns A and B contain information on total cost of production as follows:

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Quantity | Total Cost | Average Cost | Marginal Cost |
| 2 | 1 | 100 | | |
| 3 | 2 | 150 | | |
| 4 | 3 | 180 | | |
| 5 | 4 | 200 | | |
| 6 | 5 | 210 | | |
| 7 | 6 | 215 | | |

How would you go on to fill-up cells C2 to C7 and cells D3 to D7 using formula? Can you fill up cell D2?

(b) The following macroeconomic data for a hypothetical closed economy is ready in an Excel sheet (the first column and first row are labels for rows and colums):

| | A | B | C | D |
|---|---|---|---|---|
| 1 | National Income= | 1000 | Disposable Income= | |
| 2 | MPC out of disposable income= | 0.8 | Government Expenditure= | |
| 3 | Tax rate= | 0.2 | | |
| 4 | Autonomous investment= | 200 | | |

Write the formulae you will put in cells D1 and D2. After entering it, what value you would expect to appear in D2? 5+5

P.T.O.

3. Suppose you are to generate a scatter diagram in Excel which shows a negative linear pattern of association between two variables X and Y. Describe how you can go on producing the diagram by generating a set of appropriate values for the variables. Write down all the steps in details. 10

4. (a) In the context of regression analysis, software programmes report 'p-values' against each estimated coefficient. Explain with the help of a diagram the case for a p-value equal to 0.03 corresponding to a test statistic t=2.25 (with 50 degrees of freedom). What hypotheses do you test with this test statistic? What is your conclusion in this case?

(b) Following is part of a regression result of y on X1, X2 and X3:

| Variable | Coefficient | t-stat | p-value |
|---|---|---|---|
| INTERCEPT | 102.33 | T0= 5.18 | 0.000 |
| X1 | 0.01 | T1= 1.79 | 0.078 |
| X2 | –3.33 | T2= –2.25 | 0.029 |
| X3 | 3.38 | T3= 2.97 | 0.005 |
| F=3.69 | | Significance F = 0.018 | |

(i) Do you think the regression line for Y passes through the origin?

(ii) Do you think X2 affects Y significantly? How?

(iii) What do you understand by significance F?

(iv) Which of these t-values are significant at 99% level and which are NOT significant at 95% level? 5+5

5. Suppose you need to estimate the parameters of a production function

$$Q = A.L^{\alpha}.K^{\beta}.u$$ (where 'u' is an error term)

Raw data on production ($Q_i$), labour input ($L_i$) and capital employed ($K_i$) is ready in an excel sheet. State the detailed steps following which you would estimate the parameters. 10

6. (a) In a survey of 50 households, data on household's daily expenditure on food (in Rs.) is collected along with family size. Then food expenditure is regressed on family size (FSIZE) in a quadratic form. The partial regression result is produced below:

| | *Coefficients* | *Standard Error* | *t-stat* | *P-value* |
|---|---|---|---|---|
| Intercept | –20.91 | 27.19 | –0.77 | 0.45 |
| FSIZE | 216.26 | 12.38 | 17.47 | 0.00 |
| FSIZESQR | –6.92 | 1.20 | –5.79 | 0.00 |

On the basis of the above result, draw a graph showing estimated daily expenditure on food against family size for those households. Explain its shape.

(b) Using data obtained from a consumption expenditure survey covering 174 households, pre-capita expenditure on food (PFOOD) is regressed on family-size (FSIZE), proportion of adults in the household (ADLTPROP) and per-capita landholding (PCLAND). It was also found that FSIZE is not linearly related with PFOOD. In the following regression result, the variable FSIZESQR is the square of 'FSIZE'. Look carefully at this summary result and then answer the following questions:

Number of observations: 174
F (4,169) = 14.48; Prob > F = 0.000
R-squared = 0.19
Dependent variable: PFOOD

| Regressors | Coefficient | Standard Error | t-value | P-Value (P>\|t\|) |
|---|---|---|---|---|
| FSIZE | –65.98 | 11.15 | –5.92 | 0.000 |
| FSIZESQR | 3.98 | 0.66 | 6.05 | 0.000 |
| ADLTPROP | –51.09 | 38.13 | –1.34 | 0.182 |
| PCLAND | 1.29 | 0.58 | 2.23 | 0.027 |
| CONSTANT | 500.75 | 57.67 | 8.68 | 0.000 |

(i) What is meant by 'Prob > F = 0.000'?

(ii) What percentage of variation in PFOOD is explained by the regressors together?

(iii) If you are asked to reduce the number of regressors in the model, which one you will drop first and why? 5+5

7. (a) Data on consumption and income of two groups of people are available in an Excel sheet. The entire data set is given in three columns – column A containing income (Rs.), column B containing consumption (Rs.) and column C containing the code of the group (=1, if the data belongs to group I; = 2, if the data belongs to group II). The scatter projection of consumption against income (for the entire data) shows usual upward rising shape, but in two distinct sets. One set clearly lies above the other, but showing similar slope. With this background, answer the following questions:

(i) Write down the equation that you would like to estimate with the given data such that the equation is best fit in he given scatter diagram.

(ii) Do you need to modify your data in the Excel sheet for the estimation you propose? Explain the modification you will carry out.

(iii) With the parameter estimates of your model, describe diagrammatically how your regression line/lines fit into the scatter diagram (constructing the scatter following the description in the question). Explain the implication of the parameter estimates with the diagram.

(b) When you would apply a logit or a probit regression? Give one example. 7+3

P.T.O.

8. Suppose you have a file names ***exercise.dta*** in a folder named **COMP** on the **Desktop**. The file contains variables v1, v2…etc, the labels of which are described below:

| Variable | Label |
|---|---|
| Slno | Serial number of the survey instrument |
| v1 | Number of members in the household below age 15 |
| v2 | Number of members in the household above age 15 |
| v3 | Agricultural land in Bigha |
| v4 | Agricultural land in Katha |
| v5 | Age of the head of the household |
| v6 | Number of years of schooling of the household head |
| v7 | Whether the household comes under BPL list (Binary) |
| v8 | Whether the household has livestock (binary) |
| v9 | Whether the household has electricity connection (Binary) |
| v10 | Monthly average monetary expenditure by the household (Rs.) |

(a) Write a STATA DO-file that executes the following:

- Opens the data file
- Creates a variable called 'fsize' that calculates the total number of family members
- Creates a variable called 'land' that calculates the total agricultural land in Bigha
- Creates a variable called 'pcc' that calculates the per-capita monthly consumption of the household
- Rename the variables v5, v6, v7, v8 as 'hdage', 'hdedu', 'bpl' and 'lvstock' respectively.
- Delete variables 'slno' and v9-v10
- Run a regression of the following form:

  pcc = f (fsize, land, hdage, hdedu, bpl, lvstock)

(b) Write a STATA DO-file that executes all of the above steps in (a) and also stores the results in a log file names ***exercise.smcl*** in the same folder. 7+3