M.A./M.Sc. 4th Semester Examination, 2024

ECONOMICS

PAPER – ECO-401

Full Marks : 50

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

(*Gender Studies and Human Development*)

GROUP – A

[*Marks* : 20]

A.I. Answer any *two* questions from the following :

2 × 2

1. What *do you mean* by Gender Socialisation ?

2. What are the factors determining gender roles ?

3. What is the difference between Human Development Index (HDI) and Gender Development Index (GDI) ?

4. Discuss Gender Empowerment Measure (GEM).

A.II. Answer any *two* questions from the following : 4 × 2

5. Distinguish between sex and gender.

6. Discuss the agents of gender socialisation in short.

7. Discuss briefly the 'gender and development approach'.

8. What is the policy relevance of the GDI ?

A.III. Answer any *one* question from the following : 8 × 1

9. What is gender discrimination ? Discuss some effects of gender discrimination on society ? 3 + 5

10. Discuss any research paper on school dropout of girls in the context of Indian States.

GROUP – B

[*Marks* : 20]

B.I. Answer any *two* questions : 2 × 2

11. Define basic needs of a society.

12. Distinguish between capability and choice.

13. How is human transformed into capital ?

14. What is the "Difference Principle" in Rawls' Theory of Justice ?

B.II. Answer any *two* questions : 4 × 2

15. Briefly discuss the role of redistribution in ensuring sustainable *development.*

16. Discuss "Human Capital Approach," by considering any one component of human capital.

17. Discuss the concept of "full life" with respect to participatory approach under the Basic Need Approach.

18. Distinguish between subjective and objective indicators of Quality of life.

B.III. Answer any *one* question :   8 × 1

19. Discuss briefly "Capability Approach" following Professor Amartya Sen. Explain the concept of "just society" as developed in Rawls Theory of Justice.   4 + 4

20. Explain why Per-capita GDP is not considered as a good measure of welfare. Discuss briefly the method of computing Human Development Index.   4 + 4

[Internal Assessment — 10 Marks]

(*Data Analytics Theory & Application*)

GROUP – A

[*Marks* : 20]

(*Data Analytics with R Theory*)

A.I. Answer any *one* of the following : $2\frac{1}{2} \times 1$

1. Explain the function of the cor() command in R. How is it used in the context of data analysis ?

2. What does the lm() function do in R ? Describe its primary use.

A.II. Answer any *one* of the following : 5×1

3. Explain how the ggplot2 package enhances data visualization compared to base R plotting functions. Provide examples of what can be accomplished with ggplot2 that are not as straightforward with base R.

4. Analyze the following R code snippet that contains five mistakes. Correct the errors and explain each correction :

```
> modei <-lm(Weight,~ Height data = Data_
  Analysis)
> print(summary(model)
> plot(Data_Analysis$Height Data_Analysis$
  Weight, main = "Height vs. Weight",
  col 'blue')
> abline(modle, col = 'red', lwd = 2)
```

(*Application with R Studio*)

A.III. Answer any *one* of the following : $2\frac{1}{2} \times 1$

5. Using the Data_Analysis data frame, write a command to calculate and print the summary statistics of the dataset (*based on the data given in Excel file for Weight and Height*).

6. Generate a scatter plot of Height versus Weight from the Data_Analysis data frame using base R plotting function (*based on the data given in Excel file for Weight and Height*).

A.IV. Answer any *two* of the following : 5×2

7. (*a*) Fit a linear regression model using Height
        as the predictor and Weight as the response
        variable in the Data_Analysis data frame.
        Display the summary of the model.

    (*b*) Add a regression line to the scatter plot
        of Height versus Weight using the model
        you just fitted (*based on the data given
        in Excel file for Weight and Height*).

8. (*a*) Perform and interpret the Shapiro-Wilk
        test for normality on the residuals of your
        regression model.

    (*b*) Explain the output of the Durbin-Watson
        test performed on your model and what
        it indicates about the autocorrelation of
        residuals (*based on the data given in
        Excel file for Weight and Height*).

9. (*a*) Import the dataset from an Excel file with the sheet 'Mult reg' into a data frame Data_MultReg. Print the first six rows to confirm the data load.

   (*b*) Create a correlation matrix for the variables FLR, PGNP and TFR in Data_MultReg. Interpret the results briefly (*Based on the Data given in Excel file for CM, FLR, PGNP and TFR*).

10. (*a*) Fit a multiple regression model with CM as the dependent variable and FLR, PGNP, and TFR as predictors. Summarize the model and comment on the significance of each predictor.

   (*b*) Calculate the Variance Inflation Factor (VIF) for each predictor in the model to assess multicollinearity. Discuss the results and any potential actions based on the VIF scores (*Based on the Data given in Excel file for CM, FLR, PGNP and TFR*)

(*Continued*)

GROUP – B

[*Marks* : 20]

(*Data Analytics with Python Theory*)

B.I. Answer any *one* of the following : $2\frac{1}{2} \times 1$

11. Distinguish between CSV and TSV used in 'Pandas' module of Phthon.

12. What will be the output of the following simple programme in Python ? Explain

```
s=0
for i in range(10):
    s=s+i
print(s)
```

B.II. Answer any *one* of the following : 5×1

13. Consider the following Python code snippet used for linear regression analysis, which contains some errors. Correct the errors and explain what the code *is intended to do :*

(*Turn Over*)

```
import pandas as pd
from sklearn.linear_models import Linear
Regression
data = pd.read_csv('data.csv')
X = data[['Height']]
Y = data['Weight']
model = LinearRegression()
model.fit(X, Y)
print('Coefficient:', model.coef_)
print('Intercept:', model.intercept_)
```

14. Write a programme in Python two read a set of values on two variables from a text file and to compute the correlation coefficient between them.

(*Application*)

B.III. Answer any *one* of the following : $2\frac{1}{2} \times 1$

15. Using the CM, LTR, TFR and PCI dataset, calculate and interpret the Pearson correlation coefficients between LTR and TFR and between TFR and PCI.

16. Write a programme in Python to evaluate the sum of the squares of first 20 natural numbers.

B.IV. Answer any *two* of the following : 5 × 2

17. Fit a simple linear regression model to the Weight as a function of Height dataset. Evaluate the model using R-squared and report the results in your Jupyter Notebook. Include a scatter plot with the regression line.

18. For the dataset containing CM, LTR, TFR and PCI, fit a multiple linear regression model with CM as the dependent variable. Check for multicollinearity using VIF (Variance Inflation Factor) and address any issued found.

19. Put the following 10 numbers in a text file : 105, 230, 20, 71, 127, 5, 701, 100, 33 and 234. Write a programme in Python to evaluate the mean, variance and the coefficient of variation *of these numbers.*

20. Write a programme in Python to perform a regression of a dependent variable on one or two independnet variables. Use a data set of your choice of size at least 10.

[Internal Assessment — 10 Marks]

———————