



# UNIVERSITY OF RUHUNA

## Faculty of Engineering

End-Semester 3 Examination in Engineering: February 2023

Module Number: IS3301

Module Name: Basic Economics

[Three Hours]

[Answer **all questions**, each question carries ten marks]

[ Use separate booklets for **Section A** and **Section B**]

### Section A

- Q1 a) Explain why a Production Possibility Frontier (PPF) is outward-bowed shape. [3 Marks]
- b) The following relations describe monthly demand ( $Q_d$ ) and supply ( $Q_s$ ) for a toy manufacturing business.  
 $Q_d = 500 - 20P$   
 $Q_s = -200 + 15P$   
Calculate equilibrium price and equilibrium quantity. [2 Marks]
- c) If the price of a good falls from Rs. 6 To Rs. 4 and the quantity demanded rises from 8000 units to 12000 units,  
i. Calculate the price elasticity of demand by using mid-point method.  
ii. What will happen to the revenue due to price decrease? [5 Marks]
- Q2 a) What is meant by marginal utility? [2 Marks]
- b) Assume a consumer buys only two goods, X and Y. Explain the following statement.  
"An increase in money income causes a parallel outward shift in the budget line."  
[2 Marks]
- c) Consider the following table on marginal utility of X and Y commodities.

Unit	1	2	3	4	5	6
$MU_X$	200	150	125	100	75	50
$MU_Y$	600	400	200	160	80	40

While shopping, you discover that you have only Rs. 200. You have planned to consume two products X and Y. A schedule of marginal utility you expect to receive is given in above table.

Prices of commodities ( $P_X$  and  $P_Y$ ) are given as follows:

$P_X = \text{Rs. } 25$ ,  $P_Y = \text{Rs. } 40$

Find the combination of X and Y that maximizes the level of utility.

[6 Marks]

Q3 a) Briefly explain the terms "fixed cost" and "variable cost".

[2 Marks]

b) Given the total cost function:  $TC = 1000 + 10Q - 0.9Q^2 + 0.04Q^3$

i. Derive the total variable cost (TVC) function

ii. Derive the marginal cost (MC) function

[2 Marks]

c) Fill in the blanks in the following table.

Output	Total Cost	Total Fixed Cost	Total Variable Cost	Average Fixed Cost	Average Variable Cost	Average Total Cost	Marginal Cost
100	260		60				
200							0.30
300					0.50		
400						1.05	
500			360				
600							3.00

[6 Marks]

Q4 a) List three (3) main drawbacks of Pay Back Period method.

[3 Marks]

b) Wijaya Technology, a growing machine shop has a plan to automate its customer service unit. Accordingly, following expenses have been identified.

Year 1: Rs. 250,000 to purchase a computer and software designed for customer service use.

Year 2: Rs. 30,000 to purchase additional hardware.

Year 3: No expenses.

Year 4: Rs. 50,000 to purchase software upgrades.

How much money must be deposited now to cover the anticipated payments over the next 4 years?

(The company can earn 10% on a lump sum deposited currently)

[7 Marks]

## Section B

Q5 a) Identify the labour market flows which related to the following situations and mention **from** which category to which category ("Employment", "Unemployment" and "Out of labour force") the flow happens.

- i. Dilan is a government officer and takes study leave from his job to move to Australia to follow his Masters degree.
- ii. Samadhi was on maternity leave for three months and reports back to her work after completion of her maternity leave.
- iii. Nawaz was an engineering undergraduate and receives a job as soon as he completes his degree.
- iv. Rangana did not apply for any job within last four weeks as he gave up the hope of receiving a job to make a living, but, all of a sudden, he is offered a job by a company which he applied five months ago.

[2 Marks]

b) Following table carries Country A's statistics for the year 2022.

Total population	24,345,201
Employed people	6,245,411
Retired people	3,549,300
Disabled people who aged 16 years and above	98,569
Volunteers aged 16 years and above	250,660
People who aged less than 16 years	10,300,956
Students at higher education institutes aged 16 years and above	43,100

- i. Calculate the unemployment rate of Country A using above data.
- ii. Calculate the labour force participation rate of country A using above data.

[2 Marks]

c) Following table contains statistics of Country B for the year 2022.

Government purchases	Rs.926,000
Proprietors' incomes	Rs.1,820,000
Wages and salaries	Rs.5,540,000
Depreciation	Rs.390,000
Net exports	Rs.250,000
Personal consumption	Rs.23,440,000
Corporate profits	Rs.15,340,000
Income of sale of used goods	Rs.5,400,000
Gross investment	Rs.740,000



Indirect taxes	Rs.870,000
Value of inventory of goods produced in 2021	Rs.250,000
Interest income	Rs.1,396,000
Finance exchanges	Rs. 200,000

- i. Calculate the GDP of Country B using the expenditure approach.
- ii. Calculate the GDP of Country B using the income approach.
- iii. Calculate the national income of Country B.
- iv. If the population of Country B is 9000 in 2022, then calculate the GDP per capita.
- v. What is meant by 'double counting' when calculating GDP?
- vi. How to prevent from 'double counting' when calculating GDP?

[6 Marks]

- Q6 a) Following table shows the prices and quantities of four products of a market basket in 2022. Market basket carries only these four products and the base year is 2012.

Product	Market basket quantity (kg)	Price per 1kg (2012) Rs.	Price per 1kg (2022) Rs.
White Rice	300	75	250
Brown Sugar	25	65	360
Mysoor Dhal	40	85	400
Onions	35	90	240

- i. Calculate the inflation rate of the year 2022.
- ii. Elaborate the above inflation rate (answer for the above question 'i').
- iii. What is meant by demand pull inflation?
- iv. When 'demand pull inflation' occurs, what happens to the demand curve? (State the direction of the change (rightward, leftward, upward or downward) and whether it is a shift or movement.)
- v. What is meant by cost push inflation?
- vi. When 'cost push inflation' occurs, what happens to the supply curve? (State the direction of the change (rightward, leftward, upward or downward) and whether it is a shift or movement.)

[6 Marks]

- b) Following table consists of information about output per day of work of Country X and Y for the production of Tea and Coffee.

	Tea	Coffee
Country X	8	3
Country Y	6	9

- i. What is meant by comparative advantage?
- ii. Which country has the comparative advantage of producing Tea (Strengthen your answer with calculations)?
- iii. What is meant by absolute advantage?
- iv. Which country has the absolute advantage of producing Coffee (Strengthen your answer with calculations)?

[4 Marks]