



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 3 Examination in Engineering: March 2026

Module Number: IS 3301

Module Name: Basic Economics (C – 18)

[Three Hours]

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

Q1.

a) Suppose the demand function is,

$$Q_d = 80 - 3P_Y + 0.02M + 5P_Z$$

Where,

Q_d = quantity of good Y demanded

P_Y = price of good Y

M = (average) consumer income

P_Z = price of related good Z

- i. Is good Y a normal good or an inferior good? Explain your answer.
- ii. Are good Y and Z complements or substitutes? Explain your answer.
- iii. Suppose that $M = \text{Rs. } 50,000$ and $P_Z = \text{Rs. } 30$. Find the demand function for Good Y.
- iv. Suppose the supply function is:

$$Q_s = -400 + 8P_Y$$

Find the equilibrium price and quantity.

- v. What happens to the equilibrium price and quantity if income increases to Rs. 60,000, keeping other factors constant?
- vi. Suppose the government imposes a price ceiling of Rs. 70. Explain whether there will be a shortage or surplus, and calculate the quantity.
- vii. Suppose (instead of above price ceiling) the government imposes a price floor of Rs. 110. Explain whether there will be a shortage or surplus, and calculate the quantity.

[10 Marks]

Q2.

- a) What kind of shift or movement will happen to the demand or supply curves when following changes take place? State the direction of the change (rightward, leftward, upward and downward) and whether it is a shift or movement.
- A price of a substitute good decreases, what will happen to the demand curve?
 - A price of a complementary good increases, what will happen to the supply curve?
 - The product is a normal good and its price falls, what will happen to the supply curve?
 - The product is an inferior good and consumers' income increases, what will happen to the demand curve?

[4 Marks]

- b) Suppose that a firm is currently employing 60 workers, the only variable input, at a wage of Rs. 750 per employee. The average product of labour is 20, the last worker added 12 units to total output, and total fixed cost is Rs. 600,000.

- What is the marginal cost?
- What is the average variable cost?
- How much output is being produced?
- What is average total cost?
- Is the average variable cost increasing, remaining constant or decreasing?
- What is the main difference between short-run and long-run production?

[6 Marks]

Q3.

Assume that you consume three goods: Rice, Juice, and Biscuits. The marginal utility of each good is independent of the rate of consumption of the other goods. The prices of Rice, Juice, and Biscuits are respectively Rs.5, Rs.3, and Rs.1. Your total income is Rs.65. The marginal utility schedule is as follows:

Units of good	Marginal utility of Rice	Marginal utility of Juice	Marginal utility of Biscuits
1	70	60	12
2	60	55	11
3	50	48	10

4	40	40	9
5	30	32	8
6	25	24	7
7	18	21	6
8	10	18	5
9	3	15	4
10	1	12	3

- Given an income of Rs.65, how much of each good should you purchase to maximize utility (clearly show your calculations)?
- Suppose income falls to Rs.43 with the same set of prices. What combination will you choose to maximize utility?
- Let income be Rs.50, and suppose the price of Biscuits rises to Rs.2, while the prices of Rice and Juice remain at Rs.5 and Rs.3. How do you allocate your income now to maximize utility (clearly show your calculations)?
- Since the price of Biscuits is now Rs.2, you decide not to purchase Biscuits. How do you allocate an income of Rs.38 to maximize utility?
- Draw the budget line, indifference curve, and the utility-maximizing equilibrium point for the situation in above part (iv).

[10 Marks]

Q4.

You are required to evaluate the following Project X and Project Y for future investment. Both projects involve the purchase of machinery. In addition to the given costs and incomes in the tables below, Project X will generate Rs.15,000 of scrap value and Project Y will generate Rs.20,000 of scrap value at the end of the 4th year. Depreciation is allowed on a straight-line basis for both projects. The applicable discount rate is 8% per year for both projects.

Project X

	Now	1 st Year	2 nd Year	3 rd Year	4 th Year
Initial cost of purchasing machinery	Rs.60,000				
Production cost		Rs.15,000	Rs.20,000	Rs.25,000	Rs.30,000
Income		Rs.40,000	Rs.70,000	Rs.95,000	Rs.130,000

Project Y

	Now	1 st Year	2 nd Year	3 rd Year	4 th Year
Initial cost of purchasing machinery	Rs.85,000				
Production cost		Rs.18,000	Rs.22,000	Rs.28,000	Rs.35,000
Income		Rs.50,000	Rs.80,000	Rs.120,000	Rs.200,000

- i. Calculate the annual depreciation for Project X.
- ii. Calculate the annual depreciation for Project Y.
- iii. Calculate the Net Present Value (NPV) of Project X.
- iv. Calculate the Net Present Value (NPV) of Project Y.
- v. Based on NPV, which project is the better investment option? Justify your answer.
- vi. Briefly discuss two differences between the Payback Period and NPV methods.

[10 Marks]

Q5.

- a) Identify the labour market flows related to the following situations and indicate the movement from one category to another ("Employment", "Unemployment", and "Out of Labour Force").
 - i. Nimali is a software engineer and decides to take unpaid leave to pursue higher studies abroad for two years.
 - ii. Ruwan was working as a marketing executive, but he lost his job due to company downsizing and is currently searching for a new job.
 - iii. Samanthi was previously unemployed and actively looking for a job, but she has now stopped searching because she believes no suitable jobs are available.
 - iv. Kamal was not working and not looking for a job for several months, but recently started applying for jobs again.

[4 Marks]

- b) The following table presents Country A's statistics for the year 2025. Calculate the unemployment rate of Country A using the given data.

Category	Number of people
People aged 16 years and above	14,250,780
Retired people	4,120,500
Disabled people aged 16 years and above	120,450
Volunteers aged 16 years and above	310,275
Discouraged workers	85,320
Employed people	7,180,640
Students in higher education aged 16 years and above	95,800

[3 Marks]

- c) The following table contains statistics of country B for the year 2025.

Item	Value (Rs.)
Government purchases	750,000
Proprietors' incomes	300,000
Wages and salaries	2,250,000
Depreciation	60,000
Net exports	160,000
Personal consumption	11,200,000
Corporate profits	9,500,000
Income of sale of used goods	80,000
Gross investment	650,000
Indirect taxes	150,000
Value of inventory of goods produced in 2024	300,000
Interest income	500,000

- Calculate the Gross domestic product (GDP) of country B using the income approach.
- Calculate the GDP of country B using the expenditure approach.
- What can you say about the answers you obtained in parts (i) and (ii) after comparing them?
- If the population of country B is 8,000 in 2025, calculate the GDP per capita.

[4 Marks]

Q6.

- a) The following table shows the prices and quantities of three products included in the market basket of Country C. The market basket includes only these three products, and the base year is 2017.

Product	Market basket quantity (kg)	Price per 1kg (2017) Rs.	Price per 1kg (2025) Rs.
Milk	200	80	150
Tea	120	90	140
Lentils	60	100	130

- Calculate the inflation rate for the year 2025.
- How would you interpret the inflation rate calculated in part (i)?
- What is meant by a demand shock?
- State one possible reason for a demand shock.
- What is meant by a supply shock?
- State one possible reason for a supply shock.

[6 Marks]

- b) The following table provides information about output per day of work in Sri Lanka and Maldives for the production of tea and fish.

	Tea	Fish
Sri Lanka	16	8
Maldives	6	4

- Which country has the comparative advantage of producing Tea?
- Which country has the absolute advantage of producing Fish?
- According to the comparative advantage, which country should produce Fish?
- According to the absolute advantage, which country should produce Tea?

[4 Marks]