

University of Rajshahi

Dept. of Computer Science and Engineering

B.Sc. Engg. Part-I, Even Semester, Examination 2020

Course Code: ECON 1211 Course Title: Engineering Economics

Full Marks: 35

Time: 2 Hours

[N.B. Answer FOUR questions taking at least TWO from each Section.]

Section A

1. (a) Define engineering economy. Why is it important for engineers to study engineering economy? 4
- (b) Distinguish, with an example, between simple and compound interest rates. 4.75
2. (a) What is cash flow? Draw cash flow diagrams from both a borrower's point of view and a lender's point of view. 2
- (b) Explain the concept of arithmetic gradient with figures. 2
- (c) A construction firm pays \$5,000.00 for the first year of a maintenance service contract that increases by \$1,000.00 in each subsequent year until year six. If the interest rate is 6%, calculate the present worth of the uniform annual series and the gradient. 4.75
3. (a) Distinguish between nominal interest rate and effective interest rate. 2
- (b) Three different bank loan rates for electric generation equipment are listed below. Determine the effective rate on the basis of the compounding period for each rate. 4.75
- i) 9% per year, compounded quarterly.
ii) 9% per year, compounded monthly.
iii) 4.5% per 6 months, compounded weekly.
- (c) What is effective annual interest rates? 2

Section B

4. (a) What is the primary purpose of a public sector project? 1
(b) Explain how public projects are different from private projects. 3
(c) Distinguish between the conventional B/C ratio and the modified B/C ratio for a single project. 4.75
5. (a) What do you mean by inflation? How does inflation happen? 4
(b) Derive and show the relationship between market interest rate, real interest rate and the inflation rate. 2
(c) Money in a medium-risk investment makes a guaranteed 8% per year. Inflation rate has averaged 5.5% per year. What is the real rate of return on the investment? 2.75
6. (a) What are the main elements of after tax cash flows? 2
(b) A medium-sized profitable corporation may buy a \$15,000 used pickup truck for use by the shipping and receiving department. During the truck's 5-year useful life, it is estimated the firm will save \$4000 per year after all the costs of owning and operating the truck have been paid. Truck salvage value is estimated at \$4500.
i) What is the before-tax rate of return?
ii) What is the after-tax rate of return on this capital expenditure? Assume straight-line depreciation. 6.75

University of Rajshahi
Department of Computer Science and Engineering
B. Sc. (Engg.) Part-I Even Semester Examination 2019
Course: ECON 1211 (Economics)
Full Marks: 35 **Time: 2 Hours**

[Answer any Four questions taking two from each section]

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Section A

1. a) Define economics. Distinguish between microeconomics and macroeconomics. 4
b) What are the central economic problems of an economy? How these problems are solved in different economic systems? 4.75
2. a) Define demand and supply. 2
b) Derive demand and supply curves from corresponding demand and supply schedules. 4
c) What is elasticity of demand? Distinguish between arc elasticity and point elasticity with examples. 2.75
3. a) What are the characteristics of perfect competition and monopoly markets? 3
b) Draw TC, AC, MC and TFC curves. 3
c) Define market equilibrium and present market equilibrium graphically. How is equilibrium restored in a market? 2.75

Section B

4. a) Distinguish between GDP and GNP with example. 3
b) What is meant by Aggregate Demand (AD)? 1.75
c) What is double counting problem? Give an example. 4
5. a) Explain the concepts of frictional, structural and cyclical unemployment with example. 3
b) What is Philips curve? Draw short-run and long-run Philips curves. 3
c) What is tax? Distinguish between direct tax and indirect tax with example. 2.75
6. a) What is a development plan? Write the principal characteristics of a development plan? 3
b) Write the phases of development plan in Bangladesh since independence. 4
c) What are the advantages of planning approach? 1.75

University of Rajshahi

Department of Computer Science and Engineering

B.Sc. Engineering Part-1 EVEN Semester, Examination - 2018

Course Code: ECON-1211 Course Title: Economics

Full Marks: 35

Time: 2 Hours

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[N.B.: Answer Four (04) Questions taking any Two (02) Questions from each Section]

Section-A

- | | |
|---|------|
| 1. (a) Define economics system. What are the different economic system? | 2.00 |
| (b) What are the features of capitalist economic system? Discuss its advantages and disadvantages. | 6.75 |
| 2. (a) Explain demand and supply in economics. What are laws of demand and supply? | 2.75 |
| (b) What is equilibrium in the market? Explain with necessary figures. | 4.00 |
| (c) Consider a commodity $Q_{dt} = 18 - 3p$ and $Q_{st} = -3 + 4p$, where Q_{dt} , Q_{st} and p denotes quantity demanded, quantity supply and price respectively. Find the equilibrium price and quantity for that commodity. | 2.00 |
| 3. (a) Define production function. | 2.25 |
| (b) Discuss all the factors of production in brief. | 3.00 |
| (c) Write the characteristics of a perfectly competitive market. | 3.50 |

Section-B

- | | |
|--|------|
| 4. (a) What is unemployment? Explain the different types of unemployment in brief. | 5.25 |
| (b) Explain the nature of unemployment in under-developed countries. | 3.50 |
| 5. (a) What is inflation? Explain the demand-pull and cost-push inflation with example. | 3.50 |
| (b) Discuss in brief the causes of inflation. | 5.25 |
| 6. (a) What is government budget? | 2.00 |
| (b) Distinguish between revenue and capital budget. | 3.00 |
| (c) What are the major sources of revenue and heads of expenditure of Bangladesh government? | 3.75 |

University of Rajshahi
Department of Computer Science of Engineering

B. Sc. (Engg.) Part-I, Even Semester Exam - 2017

Course Title: ECON-1211 (Economics)

Total marks: 35

Time: 2 Hours

[Answer two questions from each section]

Section-A

1. a) Define Economics with criticism. Discuss the subject matter of Economics. 3
b) What are the central economic problems of every society? Discuss. 2.25
c) Explain the fundamental characteristics of different economics systems. 3.5
2. a) Distinguish between demand schedule and demand curve. Draw a demand curve from a hypothetical demand schedule. 3
b) What is meant by shift in demand and supply curves? Mention the factors that cause shifts in demand and supply curves. 2.75
c) Define elasticity of demand. Write down the formulae for computing price, income and cross elasticities of demand. 3
3. a) What is meant by production? Discuss the factors of production. 3
b) What is meant by cost of production? Distinguish between fixed costs and variable costs with the help of necessary figures. 3
c) What is a market in Economics? Discuss the characteristics of perfectly competitive market. 2.75

Section-B

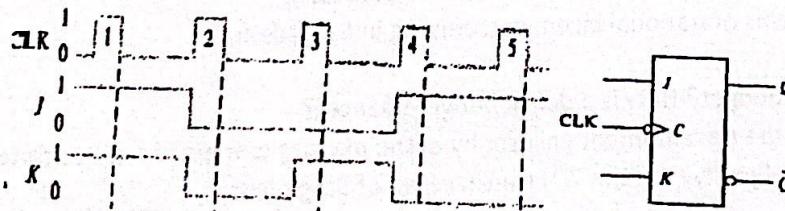
4. a) What does economic growth mean? 2
b) Explain the difference between economic growth and economic development. 4
c) Explain the circular flow of income in an economy. 2.75
5. a) Describe the different methods of national income accounting. 5.75
b) Discuss the problems of national income accounting in Bangladesh. 3
6. a) What is meant by budget? How is a deficit budget financed? 3
b) Critically examine the development philosophy of the planning commission of Bangladesh. 3
c) Explain the major objectives of the 7th Five Year Plan of Bangladesh. 2.75

Section A

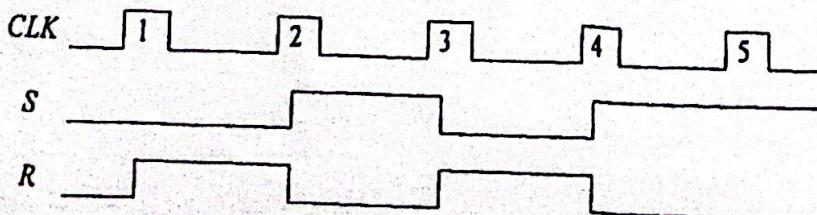
1. (a) Convert $(FBA.BC)_{16}$ to decimal and $(486.524)_{10}$ to binary. 3
 (b) Convert $(465.32)_8$ to decimal and $(11010101.1101)_2$ to Decimal. 3
 (c) Write the Excess-3 code for $(53)_{10}$. Attach an even parity bit with the generated code. 2.75
2. (a) Perform the following operations of the signed binary numbers using 2's complement method: 3
 (i) $00001100 - 11110111$ (ii) $10001000 - 11100010$
 (b) Show that both NAND gate and NOR gate can be used as universal gate. 3
 (c) Multiply the signed binary numbers: 01010011 (multiplicand) and 11000101 (multiplier). 2.75
3. (a) Explain half adder and full adder in detail with circuit diagram and truth table. 6
 (b) What is DeMorgan's theorem? Explain with truth table. 2.75
4. (a) Explain the formation of AND, OR and NOT gate using NAND gate only. 2.75
 (b) Simplify the following Boolean function using K-map and realize with basic gates: 6
 $F = (A, B, C, D) = \sum m(0, 1, 3, 5, 7, 8, 9, 13) + \sum d(10, 11, 15)$

Section B

5. (a) What are the functions of transducer and actuator? 2
 (b) Describe the basic operation of the digital-ramp ADC. 3.75
 (c) A 5-bit DAC produces $V_{out} = 0.2 V$ for a digital input of 00001. Find the value of V_{out} for an input of 11111. What would be the resolution? Describe the staircase signal out. 3
- 6(a) Draw a circuit diagram of a D latch and explain its operation. 4
 (b) The waveforms in Figure are applied to the J, K, and clock inputs as indicated. Determine the Q output, assuming that the flip-flop is initially RESET. Also explain about the states of the Q output according to the waveforms. 4.75



- 7.(a) Draw the CMOS NAND gate circuit and explain its operation. 3
 (b) Draw the TTL NOR gate circuit and explain its operation. 4
 (c) Define the terms: (i) Fan-Out (ii) Propagation Delay and (c) Noise Immunity. 1.75
8. (a) Draw the internal functional diagram of a 555 timer and explain the basic operation. 3.75
 (b) For a certain astable multivibrator $t_H = 15$ ms and $T = 20$ ms. What is the duty cycle of the output? 2
 (c) Determine the waveforms for both outputs of a positive edge triggered S-R flip-flop for the following S, R and CLK input. Assume that the flip-flop is initially RESET. 3



Part A

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|---|------|
| 1. (a) Define economics. What are the fundamental problems of any economy? | 4 |
| (b) Discuss the subject matters of microeconomics and macroeconomics. | 2 |
| (c) Explain the relation between economics and engineering | 2.75 |
| 2. a) State the law of demand. Draw a demand curve using the demand equation $Q_d = 50 - 5p$ | 3 |
| | 3.75 |
| b) What is supply? What are the causes of change in supply? Explain. | 2 |
| c) Using the following demand and supply equations, find the equilibrium quantity and market price: $Q_d = 20 - 2p$, $Q_s = 10 + 3p$ | 2.75 |
| 3. a) What is production? Discuss the four factors of production. | 3 |
| b) Define cost. Distinguish between fixed cost and variable cost. | 3 |
| c) What is a market? Discuss the main differences between perfect competition and monopoly. | 2.75 |

Part B

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|--|------|
| 4. (a) Define inflation and unemployment. | 2 |
| (b) How are inflation and unemployment related in the short-run? Explain this relationship with the help of Philips curve. | 3 |
| (c) What is business cycle? Discuss the phases of business cycle. | 3.75 |
| 5. (a) What is national income? Distinguish between Gross Domestic Product (GDP) and Gross National Product (GNP). | 3 |
| (b) What do you mean by multiplier? Prove that the investment multiplier is $\frac{\Delta Y}{\Delta I} = \frac{1}{1 - MPC}$ | 3.75 |
| (c) Suppose, the level of autonomous investment (I) in any economy is Tk. 200 crores and consumption function of the economy is $C = 80 + 0.75Y$. | 2 |
| (i) What will be the equilibrium level of income? | |
| (j) What will be the increase in national income if the investment increases by Tk. 25 crores? | |
| 6. (a) What do you mean by budget? Distinguish between revenue budget and capital budget. | 3 |
| (b) What are the major sources of revenue of the government of Bangladesh? Discuss. | 3 |
| (c) Explain the major objectives of the first five years plan of Bangladesh. | 2.75 |

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Dept. of Computer Science &
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University of Rajshahi
Department Of Computer Science and Engineering
B.Sc.(Engg.) Part-I, Even Semester Examination-2014
Course: ECON 1211 (Economics)
Full Mark: 35 Duration: 2 hours

[N.B. Answer any four questions taking two from each group. Figures in the right margin indicate full marks]

Part-A

1. a) What do you mean by economics? Explain the concepts of total product, 3
average product and marginal product in economics.
- b) Mention the three stages of production. Explain why a rational producer 5.75
concentrates producing on the second stage of the total product curve.
2. a) Discuss what are meant by price elasticity, cross price elasticity and income 3
elasticity of demand.
- b) If the demand for the commodity y increases from 5 units to 8 units as a result 2
of increase in income of a consumer from Tk. 50,000.00 to Tk. 65,000.00, find
the income elasticity of demand and comment on the nature of the commodity.
- c) Show that the price elasticity of demand ranges from zero to infinity. 3.75
3. a) What is meant by a perfectly competitive market? State its assumptions. 3
- b) Explain the conditions for obtaining equilibrium of a firm under a perfect 5.75
competition.

Part-B

4. a) Distinguish between GDP and GNP. 3
- b) Graphically explain the circular flow of national income in a simple two sector 3.75
economy.
- c) Discuss various steps of business cycle. 2
5. a) What is inflation? 2
- b) What are the features and causes of inflation? 3.75
- c) Compare among the methods of measuring national income. 3
6. a) What is meant by multiplier? 2
- b) Describe the simple Keynesian model for the determination of national income 4
with the help of expenditure method.
- c) What are the differences between revenue budget and capital budget? 2.75