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UNIVERSITY EXAMINATIONS 2024/2025

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF
TECHNOLOGY IN MECHANICAL ENGINEERING, BACHELOR OF CIVIL
ENGINEERING, ELECTRICAL ENGINEERING AND BACHELOR OF
EDUCATION TECHNOLOGY IN MECHANICAL, ELECTRICAL AND CIVIL
ENGINEERING

EMT 3401: ENGINEERING ECONOMICS AND ENTREPRENEURSHIP

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) With respect to Engineering Economics the term describe scarcity. (2 Marks)
- b) Describe the significance of resourcefulness to entrepreneurship. (2 Marks)
- c) Describe Time Value of Money. (3 Marks)
- d) Economy reflects how resources are managed and distributed to sustain economic growth, development, and stability. Differentiate the concept of Microeconomics and Macroeconomics. (3 Marks)
- e) Nabii wants to have Kshs 50,000,000 in net when he retires. To actualize this goal, he plans to invest Kshs 200,000 each year (starting one year from now) into an account that earns 18% interest compounded annually. How many years can Nabii retire as a multi-millionaire? (3 Marks)
- f) Uchumi has had Kshs 8,000 stashed under his mattress for 30 years. How much opportunity cost did he suffer by not investing the money in a bank account that



earns 8 percent annual compound interest all these years? (4 Marks)

- g) The cost of a concrete mixing machine is Kshs 500,000 and the cost of installation is Kshs 15,000. If the salvage value is 20% of the buying price of the machine at the end of 10 years, determine the book value at the end of the 7th year.

(4 Marks)

- h) The economic way of things assumes that the typical response to an economic problem of scarcity is rational behaviour. This rational evaluation compares the action's marginal benefit with its marginal cost. Describe **Marginal benefit**, **Marginal Cost** and **Sunk Costs**.

(3 Marks)

- i) What is margin of safety as applied in break even analysis? (2 Marks)

- j) Differentiate between a corporation and a co-operative forms of ownership (3 Marks)

- k) What is the useful life of an asset? (1 Marks)

QUESTION TWO (20 MARKS)

- a) Devki Steel Mills estimates that installation of Green energy (Solar PV and Wind turbine) systems in the factory will reduce the fuel bill by as much as 40%. The cost of the Green energy is Kshs 2,000,000 installed and the annual cost of taxes and insurance is 8% of the first cost. Without the green energy, the annual fuel bill is Kshs 1,000,000. If the green energy is worthless after 15 years of use, and a minimum return on investment of 12% is desired, would it be worthwhile to invest in the green energy? Solve using the ROR method. (8 Marks)

- b) Deflation refers to the sustained decrease in the overall price level of goods and services in an economy over time. Describe THREE causes of deflation.

(6 Marks)

- c) You sit in the board of MansaX who are looking to fund green start-ups in Kenya. What are the KEY mindset features do you seek in the potential entrepreneur who will benefit from your funding? (6 Marks)

QUESTION THREE (20 MARKS)

- a) Naivas PLC has implemented a program to recycle all plastic drink cups and plates used in their fast-food restaurants. Their goal is to generate Kshs 8 million by the end



of the recycle program's ten -year life. Each recycled cup and plate can be sold for Kshs 2.20

- i. How many units of cups and plates must be recycled annually to meet this goal? Assume uniform annual plastic usage and a 0% interest rate. (2 Marks)
 - ii. Repeat part (i) when the annual interest rate is 14%. (4 Marks)
 - iii. Why is the answer to part (ii) less than the answer to part (i). (2 Marks)
- b) Setting up a firm in Kenya can take different legal structure which could be a small business, a large corporation, a partnership, or any other operating legal entity to conduct business. Briefly describe the KEY steps and considerations involved while starting and registering a firm in Kenya? (8 Marks)
- c) Business enterprise have several options when it comes to raising finance for their operations, expansion, or other financial needs. Briefly describe the following sources of financing for an enterprise. (4 Marks)
- a) Strategic partnership
 - b) Joint Ventures
 - c) Trade Credit
 - d) Supplier Financing

QUESTION FOUR (20 MARKS)

- a) You have been awarded a 3-year marketing contract by Safaricom PLC to reach its target audience, promote its products, services, and ultimately drive business growth. Describe the most effective marketing strategies that you will consider while executing this contract. (8 Marks)
- b) Kenya Ports Authority spent the following amounts of for the maintenance of a gantry crane they bought: Kshs 50,000 each year for the 1st five years, Kshs 80,000 each year for the next ten years. In addition, they spent Kshs 200,000 for overhauling at the end of the 5th year and another Kshs 300,000 for overhauling at the end of the 12th year. If money is worth 14% compounded annually, what was the annuity for the 15-year period? (6 Marks)
- c) The NCA Act of 2011 established the National Construction Authority (NCA) in



order to regulate and coordinate the construction industry in Kenya. What opportunities does the Act provide in Engineering Technology? (6 Marks)

QUESTION FIVE (20 MARKS)

- a) You have been appointed as the Managing Director of the newly established Dangote oil refinery. Describe the KEY aspects of management you will observe to effectively manage the refinery. (9 Marks)
- b) MUGAJO general hardware propose to establish a corrugated iron sheet manufacturing plant that will require a fixed capital investment of Kshs 10,000,000 and an estimated working capital of Kshs 3,000,000. Annual depreciation is estimated to be 2% of the fixed capital investment. The annual profit is projected to be Kshs 4,000,000. Determine;
- i. the rate of return on the total investment. (3 Marks)
 - ii. and the minimum payback period. (3 Marks)
- c) You have been appointed as the chief finance consultant for Eagle 1 construction Ltd. As the financial advisor, which KEY factors will you consider while performing financial planning for your client's firm? (5 Marks)

