

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY



FACULTY OF ENGINEERING

DEPARTMENT OF INDUSTRIAL AND MANUFACTURING ENGINEERING

EXAMINATION

COURSE : ECONOMICS FOR ENGINEERS
CODE : EIE3126
DATE : DECEMBER 2024
DURATION : 3Hours
LECTURER :MR T KUSUWANI

INSTRUCTIONS AND INFORMATION FOR THE CANDIDATES

1. Answer ALL questions.
2. This paper contains 4 questions.
3. Show all workings.
4. Marks will be awarded for clear presentation.
5. There are 4 printed pages.

QUESTION 1

Moyana (Pvt) Ltd is considering production of two products, X and Y. The following tables denote estimated returns under different scenarios and their associated probabilities.

Product X

Scenario	Probability of outcome	Outcome
Success	25%	24%
Moderate success	50%	10%
Failure	25%	-4%

Product Y

Scenario	Probability of outcome	outcome
Success	10%	40%
Moderate success	30%	30%
Failure	60%	-5%

The above investment alternatives are mutually exclusive.

Required: Which product is mean -variance efficient?

(25 marks)

Question 2

Mangirandi (Pvt) Ltd facing high demand of its product both locally and internationally, and is failing to meet its demand. Senior management has recommended the purchase of a new improved plant and machinery, which is fast, efficient and reliable. The plant and machinery can either be bought from Germany or Japan, and the two machines have different speeds and operational capacity. Funds are a limiting factor; thus, the company can only afford one plant and machinery.

The plant and machinery from Germany's cost price is \$750 000.00. It cost \$50 000.00 to transport the machinery to Zimbabwe. As per the trade agreements between Zimbabwe and Germany, Zimra has agreed to exempt the machinery from custom duty of \$30 000.00. The Germany plant and machinery, would require renovation of the factory costing \$100 000.00, for it to fit properly. A team of engineers have to go to Germany, to inspect the plant and machinery, get first hand information and to confirm if it meets the

company specifications of the machinery. The trip will cost the company \$25 000.00. Expatriates from Germany will have to come to Zimbabwe to install the plant and machinery, costing the company \$50 000.00. After installation the Germany team will spend three months in Zimbabwe training and running tests on the machinery costing the company \$25 000.00.

The plant and machinery from Japan cost \$700 000.00. The freight charges are \$100 000.00. Due to the trade agreement between Japan and Zimbabwe custom duty of \$50 000.00 is to be paid. A Japanese expatriate will come and stay in Zimbabwe for a year, to install and ensure that the plant and machinery is up and running, costing the company \$150 000.00. No renovation of the factory is required for the Japanese plant and machinery.

The cost of capital is 10%

The following are the estimated cash inflows:

Year	Germany (Plant & Machinery) \$	Japan (Plant & Machinery) \$
1	400 000.00	100 000.00
2	400 000.00	100 000.00
3	400 000.00	100 000.00
4	400 000.00	1 000 000.00
5	400 000.00	1 000 000.00

Required: Using the net present value method, advise senior management on which plant and machinery they should invest in? (25 Marks)

QUESTION 3

(a) T & E Enterprise is considering two alternatives, either to produce its product or buy a finished product from an outsider supplier. The information about the two alternatives is given below:

To produce one unit of the product the following is required:

20kgs of materials at \$5.00 per kg

20 hours of direct labour at \$2.00 per hour

Variable overheads per unit is \$30.00

Absorbed fixed overheads \$50.00

The opportunity cost of producing one unit of the product is \$25.00.

An outside supplier has offered the company the finished product at \$190.00. The outsider does not deliver the component and the cost of transport per unit is \$10.00.

Required: Advise management whether the company should manufacture or buy the product from an outside supplier? (15 Marks)

(b) A farmer is based in a country which allows the operational of a free market system, where the price of his produce is determined by demand and supply. In 2024 the country is faced with a severe drought due to cyclone Elnino, which affected the whole of Southern Africa.

Required: With the help of diagrams explain the effect of drought on quantity supplied and demanded and the price of the produce? (10 Marks)

QUESTION 4

- (a) Compare and contrast depreciation and devaluation of a currency? (5 Marks)
- (b) What are the major differences between fiscal policy and monetary policy? (5 Marks)
- (c) What were the major problems of barter trade that lead to the creation of money? (5 Marks)
- (d) Outline the major causes of inflation in Zimbabwe? (5 Marks)
- (e) Define what is meant by externalities? (5 Marks)