

UNIVERSITY OF ESWATINI
FACULTY OF SCIENCE & ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING
MAIN EXAMINATION 2020

TITLE OF PAPER: **Engineering Management**

COURSE CODE: **EE512/EEE512**

DURATION: **3 HOURS**

INSTRUCTIONS:

1. There are **six (6)** questions in this paper. Answer any **FIVE** questions.
2. Each question carries **20 marks**.
3. If you think not enough data has been given in any question you may assume any reasonable values.
4. Useful formulae and financial table have been annexed to the paper.
5. Start each question in a new page.

This paper should not be opened until permission has been given by the invigilator.

This paper contains ten (7) pages including this page.

Question 1 (20 marks)

Donna Jamison was recently hired as a financial analyst by Computron Industries, a manufacturer of electronic calculators. Her first task was to conduct a financial analysis of the firm covering the last two years. To begin, she gathered the following financial statements and other data.

BALANCE SHEETS

1993

1992

Assets:

Cash	E 52 000.00	E 57 600.00
Accounts receivable	E 402 000.00	E 351 200.00
Inventories	E 836 000.00	E 715 200.00
Total current assets	<u>E 1 290 000.00</u>	<u>E 1 124 000.00</u>
Gross fixed assets	E 527 000.00	E 491 000.00
Less accumulated depreciation	E 166 200.00	E 146 200.00
Net fixed assets	<u>E 360 800.00</u>	<u>E 344 800.00</u>
Total assets	<u><u>E 1 650 800.00</u></u>	<u><u>E 1 468 800.00</u></u>

Liabilities and Equity:

Accounts payable	E 175 200.00	E 145 600.00
Notes payable	E 225 000.00	E 200 000.00
Accruals	E 140 000.00	E 136 000.00
Total current liabilities	<u>E 540 200.00</u>	<u>E 481 600.00</u>
Long-term debt	<u>E 424 612.00</u>	<u>E 323 432.00</u>
Common stock (100,000 shares)	E 460 000.00	E 460 000.00
Retained earnings	E 225 988.00	E 203 768.00
Total equity	<u>E 685 988.00</u>	<u>E 663 768.00</u>
Total liabilities and equity	<u><u>E 1 650 800.00</u></u>	<u><u>E 1 468 800.00</u></u>

INCOME STATEMENTS

Sales	E 3 850 000.00	E 3 432 000.00
Cost of goods sold	<u>E 3 250 000.00</u>	<u>E 2 864 000.00</u>
Other expenses	E 430 000.00	E 340 000.00
Depreciation	E 20 000.00	E 18 900.00
Total operating costs	<u>E 3 700 300.00</u>	<u>E 3 222 900.00</u>
EBIT(gross profit margin)	<u>E 149 700.00</u>	<u>E 209 100.00</u>
Interest expense	<u>E 76 000.00</u>	<u>E 62 500.00</u>
EBT	<u>E 73 700.00</u>	<u>E 146 600.00</u>
Taxes *40%)	<u>E 29 480.00</u>	<u>E 58 640.00</u>
Net income (or netprofit margin)	<u><u>E 44 220.00</u></u>	<u><u>E 87 960.00</u></u>
EPS	E 0.44	E 0.88

Other Data:

December 31 stock price	E 6.00	E 8.50
Number of shares	100 000	100 000
Dividends per share	E 0.22	E 0.22
Lease payments	E 40 000.00	E 40 000.00

INDUSTRY AVERAGE DATA FOR 1993

Ratio	Industry Average
Current	2.7x
Quick	1.0x
Inventory turnover	7.0x
Days sales outstanding (DSO)	32.0 days
Fixed assets turnover	10.7x
Total assets turnover	2.6x
Debt ratio	50.00%
Times Interest Earned (TIE)	2.5x
Fixed charge coverage	2.1x
Profit margin	3.50%
Basic earning power	19.10%
ROA	9.10%
ROE	18.20%
Price/earnings	14.2x
Market/book	1.4x

Assume that you are Donna Jamison's assistant, and that she has asked you to help her prepare a report which evaluates the company's financial condition. Then answer the following questions.

- What is the purpose of financial ratio analysis, and what are the five major categories of ratios? (3 marks)
- What are Computron's current and quick ratios? What do they tell you about the company's liquidity position? (5 marks)
- What are Computron's inventory turnover, days sales outstanding, and total assets turnover ratios? How does the firm's utilization of assets stack up against that of the industry? (7 marks)
- What are the firm's debt and times-interest-earned ratios? How does Computron compare to the industry with respect to financial leverage? What conclusions can you draw from these ratios? (5 marks)

Question 2 (20 marks)

(NPV and payback analysis) Midwest Manufacturing Company is considering two mutually exclusive investments. The projects' expected net cash flows are as follows:

Expected Net Cash Flow

Year	Project A	Project B
0	-E 300.00	-E 405.00
1	-E 387.00	E 134.00
2	-E 193.00	E 134.00
3	-E 100.00	E 134.00
4	E 600.00	E 134.00
5	E 600.00	E 134.00
6	E 850.00	E 134.00
7	-E 180.00	E 0.00

- a) Name the 5 methods for appraising projects and their advantages (5 marks)
- b) Calculate the payback period for each project (4 marks)
- c) At 10% cost of capital calculate the NPV of each project (4 marks)
- d) At 15% cost of capital calculate the NPV of each project (4 marks)
- e) Which project would you choose and why? (3 marks)

Question 3 (20 marks)

The following cost and revenue data relate to shop 48 and are typical of one of the Companies outlets:

	Per hat
Sales price.....	<u>E 30.00</u>
Variable expenses:	
Invoice cost.....	E 13.50
Sales commission.....	<u>E 4.50</u>
Total variable expenses.....	<u>E 18.00</u>
	Annual
Fixed expenses:	
Advertising.....	E 30 000.00
Rent.....	E 20 000.00
Salaries.....	<u>E 100 000.00</u>
Total fixed expenses.....	<u>E 150 000.00</u>

- a) Calculate the annual break even point in Emalangeni sales and in unit sales for shop 48. (4 marks)
- b) If 12000 hats are sold in a year, what would shop 48's net income or loss? (4 marks)
- c) The company is considering paying the store manager of Shop 48 an incentive commission of 75 cents per hat (in addition to sales person's commission). If this change is made, what will be new break-even in Emalangeni sales and in unit sales? (4 marks)
- d) As an alternative c) above, the company is considering paying the store manager 50 cents commission on each hat sold in excess of break-even point. If this change is made, what will be the shop's net income or loss if 15000 hats are sold? (4 marks)
- e) The company is considering eliminating sales commission entirely in its shops and increasing fixed salaries by E31,500 annually. If this change is made, what will be the new break-even point in Emalangeni and in unit sales for shop 48? Would you recommend that the change be made? Explain. (4 marks)

Question 4 (20 marks)

a) Name the four main functional areas of management in a organisation (4 marks)

b) Under each of the four above list at least four areas of activities (16 marks)

Question 5 (20 marks)

- a) Define Industrial Relations. (3 marks)
- b) Give one objective of each party to the Industrial Relations system. (3 marks)
- c) What is the main role of the state in the Industrial Relations system? (2 marks)
- d) What is the most obvious source of conflict in an Industrial Relations system? (2 marks)
- e) Discuss the rights and duties arising out of the Employment Relations (6 marks)
- f) Why are Trade Unions necessary in the Industrial Relations system? (4 marks)

Question 6 (20 marks)

- a) Define any five (5) key elements of the project activities a project manager is concerned with during project execution. (5 marks)
- b) Discuss circumstances under which project management may not be used. (5 marks)
- c) Give five ways in which senior management can help the course of project management in an organisations. (5 marks)
- d) As a project manager , there are several key control questions which you need to ask yourself to ensure that the project is still on course. List any 5. (5 marks)