

UNIVERSITY OF ESWATINI
MAIN EXAMINATION SECOND SEMESTER
MAY 2019

FACULTY OF SCIENCE AND ENGINEERING

**DEPARTMENT OF ELECTRICAL AND ELECTRONIC
ENGINEERING**

TITLE OF PAPER: INDUSTRIAL MANAGEMENT

COURSE CODE: EE512

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. There are six questions in this paper. Answer any FIVE questions. Each question carries 20 marks.
2. If you think not enough data has been given in any question you may assume any reasonable values.
3. Useful formulas and Financial Table have been annexed to the paper.

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION
HAS BEEN GIVEN BY THE INVIGILATOR**

THIS PAPER CONTAINS SEVEN (8) PAGES INCLUDING THIS PAGE

Question 1.

John Smith was recently hired as a financial analyst by Brickley Electronics, a manufacturer of electronic calculators. His first task was to conduct a financial analysis of the firm covering the last two years. To begin, he gathered the following financial statements and other data.

BALANCE SHEETS	19x2 E x000	19x1 E x000
Assets:		
Current assets:		
Cash	1 200.00	2 350.00
Accounts receivable	6 000.00	4 000.00
Inventories	8 000.00	10 000.00
Prepaid expenses	300.00	120.00
Total current assets	<u>15 500.00</u>	<u>16 470.00</u>
Fixed assets		
Land	4000.00	4000.00
Buildings and equipment	12000.00	8500.00
Total fixed assets	<u>16000.00</u>	<u>12500.00</u>
Total assets	<u><u>31500.00</u></u>	<u><u>28970.00</u></u>

Liabilities and Equity:

Current liabilities:		
Accounts payable	5 800.00	4 000.00
Notes payable	300.00	600.00
Accruals	900.00	400.00
Total current liabilities	<u>7 000.00</u>	<u>5 000.00</u>
Long term liabilities		
Long-term debt	7 500.00	8 000.00
Total liabilities	<u>14 500.00</u>	<u>13 000.00</u>
Equity:		
Stock	8 000.00	8 000.00
Paid in capital	1 000.00	1 000.00
Total paid in capital	<u>9 000.00</u>	<u>9 000.00</u>
Retained earnings	8 000.00	6 970.00
Total equity	<u>17 000.00</u>	<u>15 970.00</u>
Total liabilities and equity	<u><u>31 500.00</u></u>	<u><u>28 970.00</u></u>

INCOME STATEMENTS

Sales	52 000.00	48 000.00
Cost of goods sold	<u>36 000.00</u>	<u>31 000.00</u>
Gross margin	<u>16 000.00</u>	<u>17 000.00</u>
Operating expenses:		
Selling expenses	7 000.00	6 500.00
Administrative expenses	5 860.00	6 100.00
Total operating expenses	<u>12 860.00</u>	<u>12 600.00</u>
Net operating income (EBIT)	<u>3 140.00</u>	<u>3 900.00</u>
Interest expense	640.00	700.00
Net income before taxes	<u>2 500.00</u>	<u>3 200.00</u>
Income taxes (30%)	750.00	960.00
Net income (or netprofit margin)	<u><u>1 750.00</u></u>	<u><u>2 240.00</u></u>

Assume that you are John Smith's assistant, and that he has asked you to help him prepare a report which evaluates the company's financial condition. Then answer the following questions.

- a. What is the purpose of financial ratio analysis, and what are the five major categories of ratios? (3 marks)
- b. What are Brickley Electronics' current and quick ratios? What do they tell you about the company's liquidity position? (5 marks)
- c. What are Brickley Electronics' inventory turnover, days sales outstanding, and total assets turnover ratios? What do these ratios suggest about the company's financial affairs? (7 marks)
- d. What are the firm's debt and times-interest-earned ratios? What can you say about the company's leverage? (5 marks)

Question 2

(NPV and payback analysis) Perot Industries has E100 000.00 to invest. The company is trying to decide between two alternative uses of funds. The alternatives are:

Expected Net Cash Flow

Year	Project A	Project B
0	-E 100 000.00	-E 100 000.00
1	E 21 000.00	E 16 000.00
2	E 21 000.00	E 16 000.00
3	E 21 000.00	E 16 000.00
4	E 21 000.00	E 16 000.00
5	E 21 000.00	E 16 000.00
6	E 29 000.00	E 16 000.00

- 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 14% cost of capital calculate the NPV of each project (4 marks)
- d) At 8% cost of capital calculate the NPV of each project (4 marks)
- e) Which project would you choose and why? (3 marks)

Question 3

Northwood Company manufactures basketballs. The company has a standard ball that sells at E25.00. At present, the standard ball is manufactured in a small plant that relies heavily on direct labour workers. Thus, variable costs are high, totalling E15.00 per ball. Last year, the company sold 30,000 balls, with the following results:

		Per ball
Sales (30 000 standard balls).....	E 750 000.00	E 25.00
Less variable expenses:.....	E 450 000.00	E 15.00
Contribution margin.....	E 300 000.00	E 10.00
Less fixed expenses	E 210 000.00	
Net Income	E 90 000.00	

- a) Calculate the CM ratio and break- even point (4 marks)
- b) If variable costs per ball increase by E3.00, what will the new CM and Break-even point? (4 marks)
- c) Refer to b) above. If the expected change in variable costs takes place, how many balls will have to be sold next year to earn the same net income (E90 000.00) as last year? (4 marks)
- d) Refer again to b) above. The company is considering automating the plant. This automation would reduce the variable costs per ball by 40%, but would double the fixed costs (E420 000). What would be the new CM ratio and break-even point? Would you approve the automation and why? (4 marks)
- e) Refer to d) above. If the new plant is built, how many balls will have to be sold to maintain the net income of E90 000.00 (4 marks)

Question 4

- a) Define Cost-Benefit Analysis (CBA) (5 marks)
- b) What can we use Cost-Benefit Analysis for? (4 marks)
- c) Your community wishes to construct a dam in your area. How can you use the Cost-Benefit Analysis to illustrate to the community whether this is worthwhile project to embark on? (9 marks)
- d) Briefly discuss one way we can measure the Cost- Benefit of a project. (2 marks)

Question 5

In organisations, Groups are increasingly being used as an effective means for attaining organisational goals. The context, people, task requirements, formal organisation and group culture are key elements we need to analyse to understand a group's output. Under each one of the five, list four factors we have to look at while analysing performance.

(20 marks)

Question 6

- a. Define Management. (4marks)
- b. What are the four functions of management? (4marks)
- c. Under each of the four functions state, state 3 things that are involved. (12 marks)

Useful Information

Ratio	Formula for Calculation
Liquidity	
Current	$\frac{\text{Current assets}}{\text{Current liabilities}}$
Quick, or acid, test	$\frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$
Asset Management	
Inventory turnover	$\frac{\text{Sales}}{\text{Inventories}}$
Days sales outstanding (DSO)	$\frac{\text{Receivables}}{\text{Annual sales}/360}$
Fixed assets turnover	$\frac{\text{Sales}}{\text{Net fixed assets}}$
Total assets turnover	$\frac{\text{Sales}}{\text{Total assets}}$
Debt Management	
Total debt to total assets	$\frac{\text{Total debt}}{\text{Total assets}}$
Times-interest-earned (TIE)	$\frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Interest charges}}$
Fixed charge coverage	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Interest charges} + \text{Lease payments} + \frac{\text{SF payments}}{(1 - T)}}$
Profitability	
Profit margin on sales	$\frac{\text{Net income available to common stockholders}}{\text{Sales}}$
Basic earning power	$\frac{\text{Earnings before interest and taxes (EBIT)}}{\text{Total assets}}$
Return on total assets (ROA)	$\frac{\text{Net income available to common stockholders}}{\text{Total assets}}$
Return on common equity (ROE)	$\frac{\text{Net income available to common stockholders}}{\text{Common equity}}$
Market Value	
Price/earnings (P/E)	$\frac{\text{Price per share}}{\text{Earnings per share}}$
Market/book	$\frac{\text{Market price per share}}{\text{Book value per share}}$

APPENDIX A

TABLE A

PRESENT VALUE TABLES

APPENDIX TABLE 1

Discount factors: Present value of \$1 to be received after t years = $1/(1 + r)^t$.

Number of Years	Interest Rate per Year														
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	.980	.961	.943	.925	.907	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756
3	.971	.942	.915	.889	.864	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658
4	.961	.924	.888	.855	.823	.792	.763	.735	.708	.683	.659	.636	.613	.592	.572
5	.951	.906	.863	.822	.784	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497
6	.942	.888	.837	.790	.746	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432
7	.933	.871	.813	.760	.711	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376
8	.923	.853	.789	.731	.677	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327
9	.914	.837	.766	.703	.645	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284
10	.905	.820	.744	.676	.614	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247
11	.896	.804	.722	.650	.585	.527	.475	.429	.388	.350	.317	.287	.261	.237	.215
12	.887	.788	.701	.625	.557	.497	.444	.397	.356	.319	.286	.257	.231	.208	.187
13	.879	.773	.681	.601	.530	.469	.415	.368	.326	.290	.258	.229	.204	.182	.163
14	.870	.758	.661	.577	.505	.442	.388	.340	.299	.263	.232	.205	.181	.160	.141
15	.861	.743	.642	.555	.481	.417	.362	.315	.275	.239	.209	.183	.160	.140	.123
16	.853	.728	.623	.534	.458	.394	.339	.292	.252	.218	.188	.163	.141	.123	.107
17	.844	.714	.605	.513	.436	.371	.317	.270	.231	.198	.170	.146	.125	.108	.093
18	.836	.700	.587	.494	.416	.350	.296	.250	.212	.180	.153	.130	.111	.095	.081
19	.828	.686	.570	.475	.396	.331	.277	.232	.194	.164	.138	.116	.098	.083	.070
20	.820	.673	.554	.456	.377	.312	.258	.215	.178	.149	.124	.104	.087	.073	.061

Number of Years	Interest Rate per Year														
	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	26%	27%	28%	29%	30%
1	.862	.855	.847	.840	.833	.826	.820	.813	.806	.800	.794	.787	.781	.775	.769
2	.743	.731	.718	.706	.694	.683	.672	.661	.650	.640	.630	.620	.610	.601	.592
3	.641	.624	.609	.593	.579	.564	.551	.537	.524	.512	.500	.488	.477	.466	.455
4	.552	.534	.516	.499	.482	.467	.451	.437	.423	.410	.397	.384	.373	.361	.350
5	.476	.456	.437	.419	.402	.386	.370	.355	.341	.328	.315	.303	.291	.280	.269
6	.410	.390	.370	.352	.335	.319	.303	.289	.275	.262	.250	.238	.227	.217	.207
7	.354	.333	.314	.296	.279	.263	.249	.235	.222	.210	.198	.188	.178	.168	.159
8	.305	.285	.266	.249	.233	.218	.204	.191	.179	.168	.157	.148	.139	.130	.123
9	.263	.243	.225	.209	.194	.180	.167	.155	.144	.134	.125	.116	.108	.101	.094
10	.227	.208	.191	.176	.162	.149	.137	.126	.116	.107	.099	.092	.085	.078	.073
11	.195	.178	.162	.148	.135	.123	.112	.103	.094	.086	.079	.072	.066	.061	.056
12	.168	.152	.137	.124	.112	.102	.092	.083	.076	.069	.062	.057	.052	.047	.043
13	.145	.130	.116	.104	.093	.084	.075	.068	.061	.055	.050	.045	.040	.037	.033
14	.125	.111	.099	.088	.078	.069	.062	.055	.049	.044	.039	.035	.032	.028	.025
15	.108	.095	.084	.074	.065	.057	.051	.045	.040	.035	.031	.028	.025	.022	.020
16	.093	.081	.071	.062	.054	.047	.042	.036	.032	.028	.025	.022	.019	.017	.015
17	.080	.069	.060	.052	.045	.039	.034	.030	.026	.023	.020	.017	.015	.013	.012
18	.069	.059	.051	.044	.038	.032	.028	.024	.021	.018	.016	.014	.012	.010	.009
19	.060	.051	.043	.037	.031	.027	.023	.020	.017	.014	.012	.011	.009	.008	.007
20	.051	.043	.037	.031	.026	.022	.019	.016	.014	.012	.010	.008	.007	.006	.005

Note: For example, if the interest rate is 10 percent per year, the present value of \$1 received at year 5 is \$.621.