

**UNIVERSITY OF SWAZILAND**  
**MAIN EXAMINATION, SECOND SEMESTER**  
**MAY 2018**

**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 EIGHT (8) PAGES INCLUDING THIS PAGE**

**QUESTION ONE (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	2016	2015
<b>Assets:</b>		
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>
<b>Liabilities and Equity:</b>		
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	<u>E 225 988.00</u>	<u>E 203 768.00</u>
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>
<b>INCOME STATEMENTS</b>		
Sales	<u>E 3 850 000.00</u>	<u>E 3 432 000.00</u>
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 net-profit margin)	<u><u>E 44 220.00</u></u>	<u><u>E 87 960.00</u></u>
EPS	E 0.44	E 0.88
<b>Other Data:</b>		
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 2016**

<b>Ratio</b>	<b>Industry Average</b>
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.

- a. What is the purpose of financial ratio analysis, and what are the five major categories of ratios? (3)
- b. What are Computron's current and quick ratios? What do they tell you about the company's liquidity position? (5)
- c. What are Computron's inventory turnover, days sales outstanding, and total assets Turn-over ratios? How does the firm's utilization of assets stack up against that of the industry? (7)
- d. 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)

**QUESTION TWO (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)
- b) Calculate the payback period for each project ( 4)
- c) At 10% cost of capital calculate the NPV of each project ( 4)
- d) At 16% cost of capital calculate the NPV of each project ( 4)
- e) Which project would you choose? ( 3)

**QUESTION THREE (20marks)**

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

Sales price.....		<b>Per hat</b> E 30.00
Variable expenses:		
Invoice cost.....		E 13.50
Sales commission.....		E 4.50
Total variable expenses.....		<u>E 18.00</u>
		<b>Annual</b>
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)
- b) If 12000 hats are sold in a year, what should be shop 48's net income or loss? (4)
- 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)
- 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)
- 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)

**QUESTION FOUR (20 marks)**

- a) Name the four main functional areas of management in an organisation (4)
- b) Under each of the four above list at least four areas of activities (16)

**QUESTION FIVE (20 marks)**

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

**QUESTION SIX (20 marks)**

- a) Define any five (5) key elements of the project activities a project manager is concerned with during project execution. (5)
- b) Discuss circumstances under which project management may not be used. (5)
- c) Give five ways in which senior management can help the course of project management in an organisations. (5)
- 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)



# Useful Information

Ratio	Formula for Calculation
<b>Liquidity</b>	
Current	$\frac{\text{Current assets}}{\text{Current liabilities}}$
Quick, or acid, test	$\frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$
<b>Asset Management</b>	
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	$\frac{\text{Sales}}{\text{Total assets}}$
<b>Debt Management</b>	
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	$\frac{\text{Earnings before interest and taxes} + \text{Lease payments}}{\text{Interest charges} + \text{Lease payments} + \frac{\text{SF payments}}{(1 - T)}}$
<b>Profitability</b>	
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)	$\frac{\text{Net income available to common stockholders}}{\text{Common equity}}$
<b>Market Value</b>	
Price/earnings (P/E)	$\frac{\text{Price per share}}{\text{Earnings per share}}$
Market/book	$\frac{\text{Market price per share}}{\text{Book value per share}}$

TABLE 1  
Present Value of 1 due at the end of the year shown  
Various Discounting Rates

Years	1%	2%	3%	4%	5%	6%	7%	8%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460
26	0.7720	0.5976	0.4637	0.3607	0.2812	0.2198	0.1722	0.1352
27	0.7644	0.5859	0.4502	0.3468	0.2678	0.2074	0.1609	0.1252
28	0.7568	0.5744	0.4371	0.3335	0.2551	0.1956	0.1504	0.1159
29	0.7493	0.5631	0.4243	0.3207	0.2429	0.1846	0.1406	0.1073
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994
31	0.7346	0.5412	0.4000	0.2965	0.2204	0.1643	0.1228	0.0920
32	0.7273	0.5306	0.3883	0.2851	0.2099	0.1550	0.1147	0.0852
33	0.7201	0.5202	0.3770	0.2741	0.1999	0.1462	0.1072	0.0789
34	0.7130	0.5100	0.3660	0.2636	0.1904	0.1379	0.1002	0.0730
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676
36	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626
37	0.6920	0.4806	0.3350	0.2343	0.1644	0.1158	0.0818	0.0580
38	0.6852	0.4712	0.3252	0.2253	0.1566	0.1092	0.0765	0.0537
39	0.6784	0.4619	0.3158	0.2166	0.1491	0.1031	0.0715	0.0497
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460
41	0.6650	0.4440	0.2976	0.2003	0.1353	0.0917	0.0624	0.0426
42	0.6584	0.4353	0.2890	0.1926	0.1288	0.0865	0.0583	0.0395
43	0.6519	0.4268	0.2805	0.1852	0.1227	0.0816	0.0545	0.0365
44	0.6454	0.4184	0.2724	0.1780	0.1169	0.0770	0.0509	0.0338
45	0.6391	0.4102	0.2644	0.1712	0.1113	0.0727	0.0476	0.0313
46	0.6327	0.4022	0.2567	0.1646	0.1060	0.0685	0.0445	0.0290
47	0.6265	0.3943	0.2493	0.1583	0.1009	0.0647	0.0416	0.0269
48	0.6203	0.3865	0.2420	0.1522	0.0961	0.0610	0.0389	0.0249
49	0.6141	0.3790	0.2350	0.1463	0.0916	0.0575	0.0363	0.0230
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213
51	0.6020	0.3642	0.2215	0.1353	0.0831	0.0512	0.0317	0.0197
52	0.5961	0.3571	0.2150	0.1301	0.0791	0.0483	0.0297	0.0183
53	0.5902	0.3501	0.2088	0.1251	0.0753	0.0456	0.0277	0.0169
54	0.5843	0.3432	0.2027	0.1203	0.0717	0.0430	0.0259	0.0157
55	0.5785	0.3365	0.1968	0.1157	0.0683	0.0406	0.0242	0.0145
56	0.5728	0.3299	0.1910	0.1112	0.0651	0.0383	0.0226	0.0134
57	0.5671	0.3234	0.1855	0.1069	0.0620	0.0361	0.0211	0.0124
58	0.5615	0.3171	0.1801	0.1028	0.0590	0.0341	0.0198	0.0115
59	0.5560	0.3109	0.1748	0.0989	0.0562	0.0321	0.0185	0.0107
60	0.5505	0.3048	0.1697	0.0951	0.0535	0.0303	0.0173	0.0099

## PRESENT VALUE OF 1

Years	9%	10%	11%	12%	13%	14%	15%	16%
1	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621
2	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432
3	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407
4	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523
5	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761
6	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104
7	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538
8	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050
9	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630
10	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267
11	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954
12	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685
13	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452
14	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252
15	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079
16	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930
17	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802
18	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691
19	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596
20	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514
21	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443
22	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382
23	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329
24	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349	0.0284
25	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245
26	0.1064	0.0839	0.0663	0.0525	0.0417	0.0331	0.0264	0.0211
27	0.0976	0.0763	0.0597	0.0469	0.0369	0.0291	0.0230	0.0182
28	0.0895	0.0693	0.0538	0.0419	0.0326	0.0255	0.0200	0.0157
29	0.0822	0.0630	0.0485	0.0374	0.0289	0.0224	0.0174	0.0135
30	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116
31	0.0691	0.0521	0.0394	0.0298	0.0226	0.0172	0.0131	0.0100
32	0.0634	0.0474	0.0355	0.0266	0.0200	0.0151	0.0114	0.0087
33	0.0582	0.0431	0.0319	0.0238	0.0177	0.0132	0.0099	0.0075
34	0.0534	0.0391	0.0288	0.0212	0.0157	0.0116	0.0086	0.0064
35	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055
36	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048
37	0.0412	0.0294	0.0211	0.0151	0.0109	0.0078	0.0057	0.0041
38	0.0378	0.0267	0.0190	0.0135	0.0096	0.0069	0.0049	0.0036
39	0.0347	0.0243	0.0171	0.0120	0.0085	0.0060	0.0043	0.0031
40	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026
41	0.0292	0.0201	0.0139	0.0096	0.0067	0.0046	0.0032	0.0023
42	0.0268	0.0183	0.0125	0.0086	0.0059	0.0041	0.0028	0.0020
43	0.0246	0.0166	0.0112	0.0076	0.0052	0.0036	0.0025	0.0017
44	0.0226	0.0151	0.0101	0.0068	0.0046	0.0031	0.0021	0.0015
45	0.0207	0.0137	0.0091	0.0061	0.0041	0.0027	0.0019	0.0013
46	0.0190	0.0125	0.0082	0.0054	0.0036	0.0024	0.0016	0.0011
47	0.0174	0.0113	0.0074	0.0049	0.0032	0.0021	0.0014	0.0009
48	0.0160	0.0103	0.0067	0.0043	0.0028	0.0019	0.0012	0.0008
49	0.0147	0.0094	0.0060	0.0039	0.0025	0.0016	0.0011	0.0007
50	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006
51	0.0123	0.0077	0.0049	0.0031	0.0020	0.0013	0.0008	0.0005
52	0.0113	0.0070	0.0044	0.0028	0.0017	0.0011	0.0007	0.0004
53	0.0104	0.0064	0.0040	0.0025	0.0015	0.0010	0.0006	0.0004
54	0.0095	0.0058	0.0036	0.0022	0.0014	0.0008	0.0005	0.0003
55	0.0087	0.0053	0.0032	0.0020	0.0012	0.0007	0.0005	0.0003
56	0.0080	0.0048	0.0029	0.0018	0.0011	0.0007	0.0004	0.0002
57	0.0074	0.0044	0.0026	0.0016	0.0009	0.0006	0.0003	0.0002
58	0.0067	0.0040	0.0024	0.0014	0.0008	0.0005	0.0003	0.0002
59	0.0062	0.0036	0.0021	0.0012	0.0007	0.0004	0.0003	0.0002
60	0.0057	0.0033	0.0019	0.0011	0.0007	0.0004	0.0002	0.0001