

**UNIVERSITY OF SWAZILAND**  
**MAIN EXAMINATION 2010/11**

**FACULTY OF SCIENCE**

**DEPARTMENT OF ELECTRICAL AND ELECTRONIC  
ENGINEERING**

**TITLE OF PAPER:** INDUSTRIAL MANAGEMENT

**COURSE CODE:** E520

**TIME ALLOWED:** THREE HOURS

---

**INSTRUCTIONS:**

- 1) Answer any FIVE of the SIX questions.
  - 2) Each question carries 20 marks distributed as shown on the right margin.
  - 3) A sheet of Selected Formulas and a PV Table are attached
- 

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

**This question paper has 11 pages including this page and 3 pages of Attachments**

### Question 1.

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	E 424,612.00	E 323,432.00
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	<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 netprofit margin)	<u><u>E 44,220.00</u></u>	<u><u>E 87,960.00</u></u>
EPS	<u>E 0.44</u>	<u>E 0.88</u>

##### 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

<u>Ratio</u>	<u>Industry Average</u>
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 marks)
- b. What are Computron's current and quick ratios? What do they tell you about the company's liquidity position? ( 5 marks)
- c. 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)
- 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 marks)

## Question 2

**(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 16% cost of capital calculate the NPV of each project ( 4 marks)
- e) Which project would you choose? ( 3 marks)

### Question 3

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.....	E 100,000.00
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**

a) Explain each of the following terms: Finished goods, opportunity cost, sunk cost, work in progress and fixed cost. ( 5 marks)

b) The following cost and inventory data are taken from the books of Mason Company for the year 19x8:

Costs incurred:

Direct labour cost.....	E 70,000.00
Purchases of raw materials.....	118000
Indirect labour.....	30000
Maintenance, factory equipment.....	6000
Advertising expense.....	90000
Insurance, factory equipment.....	800
Sales salaries.....	50000
Rent, factory facilities.....	20000
Supplies.....	4200
Depreciation, office equipment.....	3000
Depreciation, factory equipment.....	19000

	January 1, 19x8	31-Dec 19x8
Inventories:		
Raw materials.....	E 7,000.00	E 15,000.00
Work in progress .....	10000	5000
Finished goods .....	20000	35000

a) Prepare a schedule of costs of goods manufactured in good form. (10 marks)

b) Prepare the cost of goods sold section of Mason Company's income statement for the year. ( 5 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 the role of management in so far as organising is concerned. ( 4 marks)
- b) Give one function an organisational structure serves. ( 1 mark)
- c) Describe five criteria for assessing the strength or weakness of a structure. ( 5 marks)
- d) Using the five criteria, compare the functional and divisional structures. ( 10 marks)



# 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