

UNIVERSITY OF SWAZILAND
MAIN EXAMINATION 2007/8

FACULTY OF SCIENCE

DEPARTMENT OF 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
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PERMISSION HAS BEEN GIVEN BY THE INVIGILATOR***

This question paper has 8 pages including this page and 3 pages of Attachments

Question 1

PRECISION COMPANY
Comparative Income Statement
For Years Ended December 31, 1994 and 1993

	1994	1993
Sales	2,486,000	2,075,000
Cost of goods sold	1,523,000	1,222,000
Gross profit from sales	<u>963,000</u>	<u>853,000</u>
Operating expenses:		
Advertising expense	145,000	100,000
Sales salaries expense	240,000	280,000
Office salaries expense	165,000	200,000
Insurance expense	100,000	45,000
Supplies expense	26,000	35,000
Depreciation expense	85,000	75,000
Miscellaneous expense	17,000	15,000
Total operating expenses	<u>778,000</u>	<u>750,000</u>
Operating income	185,000	103,000
Less interest expense	44,000	46,000
Income before taxes	141,000	57,000
Income taxes	47,000	19,000
Net income	<u>94,000</u>	<u>38,000</u>
Earnings per share		

PRECISION COMPANY
Comparative Balance Sheet
December 31, 1994, and December 31, 1993

Assets	1994	1993
Current assets:		
Cash	79,000	42,000
Short-term investments	65,000	96,000
Accounts receivable (net)	120,000	100,000
Merchandise inventory	250,000	265,000
Total current assets	514,000	503,000
Plant and equipment:		
Store equipment (net)	400,000	350,000
Office equipment (net)	45,000	50,000
Buildings (net)	625,000	675,000

Land	100,000	100,000
Total plant and equipment	1,170,000	1,175,000
Total assets	1,684,000	1,678,000

Liabilities

Current liabilities:

Accounts payable	164,000	190,000
Short-term notes payable	75,000	90,000
Taxes payable	26,000	12,000
Total current liabilities	265,000	292,000

Long-term liabilities:

Notes payable (secured by mortgage on building and land) ...	400,000	420,000
Total liabilities	665,000	712,000

Stockholders' Equity

Common stock, E5 par value	475,000	475,000
Retained earnings	544,000	491,000
Total stockholders' equity	<u>1,019,000</u>	<u>966,000</u>
Total liabilities and equity	<u>1,684,000</u>	<u>1,678,000</u>

You are required to calculate, for both years the following ratios:

- | | |
|---|-----|
| a) Current | (2) |
| b) Acid Test | (2) |
| c) Days sales is uncollected or outstanding | (2) |
| d) Interest times cover | (2) |
| e) Profit margin (net) | (2) |
| f) Gearing | (2) |

Comment on the findings from the above results.	(8)
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Question 2

Toy Motors needs a new machine for production of its 2001 models.

The financial vice president has appointed you to do the capital budgeting analysis. You have identified two different machines that are capable of performing the job. You have completed the cash flow analysis, and the expected net cash flows are as follows:

Expected Net Cash Flow

<u>Year</u>	<u>Machine B</u>	<u>Machine O</u>
0	-E5 000	-E5 000
1	2 085	0
2	2 085	0
3	2 085	0
4	2 085	9 677

Question 2(a)

What is the payback period (in years) for Machine B? (2)

Question 2(b)

If the cost of capital for both projects is fourteen percent (14%) at the time the decision is made, which project would you choose? (6)

Question 2(c)

If the cost of capital (interest) is eight percent (8%), which project would you choose this time. (6)

Question 2(d)

What is your conclusion about the projects? (6)

Question 3

The Fashion Headwear Company operates a chain of hat shops around the country. The shops carry many styles of hats that are all sold at the same price. Sales personnel in the shops are paid a substantial commission on each hat sold (in addition to a small basic salary) in order to encourage them to be aggressive in their sales efforts.

The following cost and revenue data relate to Shop 48 and are typical of one of the company's many outlets:

	Per Hat
Sales price	<u>E 30.00</u>
Variable expenses:	
Invoice cost	E 13.50
Sales commission	<u>4.50</u>
Total variable expenses	<u>E 18.00</u>

	Annual
Fixed expenses:	
Advertising	E 30,000
Rent	20,000
Salaries	<u>100,000</u>
Total fixed expenses	<u>E 150,000</u>

- (a) Calculate the annual break-even point in Emalangeni sales and in unit sales for Shop 48. (5)
- (b) If 12,000 hats are sold in a year, what would be Shop 48's net income or loss? (5)
- (c) The company is considering paying the store manager of Shop 48 an incentive commission of 75 cents per hat (in addition to the salespersons' commission). If this change is made, what will be the new break-even point in Emalangeni sales and in unit sales? (5)
- (d) Refer to the original data. As an alternative to (c) above, the company is considering paying the store manager 50 cents commission on each hat sold in excess of the break-even point. If this change is made, what will be the shop's net income or loss if 15,000 hats are sold? (5)

Question 4

Schedule of Cost of Goods Manufactured; Cost Behavior Various cost and sales data for Meriwell Company for 19x6 follow:

Finished goods inventory, January 1	E 20,000
Finished goods inventory, December 31	40,000
Depreciation, factory	27,000
Administrative expenses	110,000
Utilities, factory	8,000
Maintenance, factory	40,000
Supplies, factory	11,000
Insurance, factory	4,000
Purchase of raw materials	125,000
Raw materials inventory, January 1	9,000
Raw materials inventory, December 31	6,000
Direct labor	70,000
Indirect labor	15,000
Work in process inventory, January 1	17,000
Work in process inventory, December 31	30,000
Sales	500,000
Selling expenses	80,000

- (a) Prepare a schedule of cost of goods manufactured for 19x6. (5)
- (b) Prepare a cost of goods sold schedule. (5)
- (c) Prepare an income statement for 19x6. (5)
- (d) Assume that the company produced the equivalent of 10,000 units of product during 19x6. What was the unit cost for direct materials? What was the unit cost for factory depreciation?
(5)

Question 5

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

Question 6

- (a) What are three (3) main causes of diseases and accidents respectively, in a work-place? (6)
- (b) How can these diseases and accidents be minimised? (6)
- (c) Discuss the roles of the state, the employer and the employee in so far as health and safety at work is concerned. (8)

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	$\frac{\text{Market price per share}}{\text{Book value per share}}$

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