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MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University, Manipal – 576 104



VI SEM. B.TECH. END SEMESTER EXAMINATION
SUBJECT: ESSENTIALS OF MANAGEMENT & ENGINEERING ECONOMICS
(HSS 302)

REVISED CREDIT SYSTEM
(14/05/2014)

Time: 3 Hour.

MAX.MARKS: 50

Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** questions.
- ❖ **Interest table** is provided in the last page of the paper (else use formula).

- 1a)** How would you define management? Classify the industries on the basis of their activities and give suitable examples? **(03)**
- 1b)** Distinguish between verifiable and non-verifiable objectives with suitable examples. **(02)**
- 1c)** Select a leader whom you admire, and identify his or her style of leadership by applying the managerial grid. **(03)**
- 1d)** Explain briefly feed-forward control with an example. Why is it important to managers? **(02)**
- 2a)** What are the differences between productivity, efficiency and effectiveness? **(03)**
- 2b) Case Study:**

Daewoo was founded in 1967 by its hardworking, relentlessly driven chairman Kim Woo-Choong. After its initial success in exporting textiles, the company expanded into trade, autos, machinery, consumer electronics, construction, heavy shipping, computers, telephones, and financial services, becoming Korea's fourth largest business group. It became a textile supplier for Sears, Christian Dior, Calvin Klein, and London Fog. It also engaged in a joint venture with General Motors (GM) to build the Le Mans car. However, labor and other problems limited car shipments.

Chairman Kim's philosophy of hard work and the value placed in people were important factors in the firm's success. However, in the late 1980s and early 1990s, the company faced several problems. For one, Kim was concerned that, with the increasing prosperity of Koreans, the work force might lose the spirit of hard work. Moreover, there was growing discontent among younger workers and decreasing motivation.

Through Kim's hands-off approach to managing, some of the companies in the Daewoo group went out of control. For example, in the unprofitable heavy shipping unit, he noticed many unnecessary expenses. The elimination of company-sponsored barbershops saved the company \$8 million a year. In general, Daewoo's work force

was young and well educated. In contrast to similar positions in many other Korean companies, top positions at Daewoo were occupied by managers with no family ties.

Although Daewoo was a major company with its 91,000 employees, it was not dominant in any one industry. The strategy of being a supplier for major companies, such as Caterpillar, GM, and Boeing, may have led to opportunities being bypassed for becoming a major marketer of its own brands. Now in the 1990s, Kim was also looking at opportunities in Europe; for example, he formed a joint venture with a distribution company in France.

The massive restructuring had already shown some positive effects. Kim sold some steel, financial, and real estate units. The hands-off managerial style had been replaced by a hands-on style, resulting in re-centralization. Managers were “retired” or otherwise let go. Thousands of positions were also eliminated.

Things were looking better in 1991. The company lost money in 1988 and 1989 but made some profit in 1990 partly because of the sale of some major assets. The joint venture with GM registered a healthy growth. The company was also optimistic about the future of the new compact car Espero. Still, Daewoo had to cope with its labor costs and Japanese competition.

What looked good in the early 1990s dramatically changed in the latter part of that decade and especially in the years 2000 to 2002. In 2000, Ford planned to buy Daewoo Motor for some \$7billion. However, the deal fell apart later that year. Moreover, the company went bankrupt in November 2000. Chairman Kim mysteriously disappeared. He liked to think big, and he also left behind the company with big debts. Several billion dollars were also unaccounted for. With Ford out of the picture, GM entered seriously into negotiations with Daewoo, which was once Korea’s second biggest car maker. On April 30, 2002, GM agreed to buy the bankrupt company, which was renamed as GM-Daewoo. What is in it for GM? The acquisition is a key component of its global strategy. On the other hand, restructuring Daewoo is going to be a formidable task. The brand image has to be restored and the Korean market share of 10 percent (which was 37 percent in 1998) has to be improved. The product line also has to be reviewed and complemented with new models. Moreover, GM-Daewoo can expect difficulties with Korea’s aggressive unions.

Questions:

- i. What are the advantages and disadvantages of hands-off, decentralized management approach? **(02)**
- ii. What were some of the controllable and uncontrollable factors in this case? How should Mr. Kim have responded to those factors? **(03)**
- iii. How can Daewoo stay competitive with the Japanese? **(02)**

- 3a)** What are the advantages and disadvantages of written and oral communication? (03)
Which do you prefer - written or oral? Under what circumstances?
- 3b)** “Planning is Pervasive” – Explain this statement. List any other four characteristics of planning. (02)
- 3c)** What are Strategic Business Units? What are the criteria that should be met by a business unit to be called as an SBU? (03)
- 3d)** Explain briefly the two assumptions on human nature according to Douglas McGregor. (02)
- 4a)** Explain the price elasticity of demand and its categories. Also mention its significance on total revenue. (03)
- 4b)** A man decides to deposit \$50 in the bank today and to make 10 additional deposits every 6 months beginning 6 months from now, the first of which will be \$50 and increasing \$10 per deposit after that. A few minutes after making the last deposit, he decides to withdraw all the money deposited. If the bank pays 6% nominal interest compounded semi-annually, how much money will he receive? (03)
- 4c)** A road building contractor has received a major highway construction contract that will require 50,000m³ of crushed stone each year for 5 years. The needed stone can be obtained from a quarry for \$5.80 per m³. As an alternative, the contractor has decided to try and purchase the quarry. He believes that if he owned the quarry, the stone would only cost him \$4.301 per m³. He thinks, he could resell the quarry at-the end of 5 years for \$40,000. If the contractor uses a 6% interest rate, how much would he be willing to pay for the quarry? (04)
- 5a)** A trust fund is to be established for three purposes: (03)
- To provide \$750,000 for the construction and \$250,000 for the initial equipment of a small engineering laboratory.
 - To pay the \$150,000 per year laboratory operating cost; and
 - To pay for \$100,000 of replacement equipment every 4 years, beginning 4 years from now.
- At 6% interest, how much money is required in the trust fund to provide for the laboratory and equipment and its perpetual operation and equipment replacement?
- 5b)** An asset was purchased 10 years ago for Rs. 4800. It is being depreciated according to straight line method for an estimated life of 20 years and a salvage value by Rs.800. What is the difference in its current book value and the book value that would have resulted if double declining balance method is adopted. (03)
- 5c)** Polymer Moulding, Inc., is considering two processes for manufacturing storm drains. Plan A involves conventional injection moulding that will require making a steel mould at a cost of \$2 million. The cost for inspecting, maintaining, and cleaning the moulds is expected to be \$5000 per year. The cost of materials for this plan is expected to be (04)

the same as for the other plan. Plan B involves using an innovative process known as virtual engineered composites wherein a floating mould uses an operating system that constantly adjusts the water pressure around the mould and the chemicals entering the process. The first cost to tool the floating mould is only \$25,000, but because of the newness of the process, personnel and product-reject costs are expected to be higher than those for a conventional process. The company expects the operating costs to be \$45,000 per year for the first 8 years and then to decrease to \$10,000 per year thereafter. At an interest rate of 6% per year, which process should the company select on the basis of an annual worth analysis over a 14-year study period?

- 6a)** As proprietor of your own business, you are considering the option of purchasing a new high-efficiency machine to replace older machines currently in use. You believe that the new technology can be used to replace four of the older machines, each with a current market value of \$600. The new machine will cost \$5000 and will save the equivalent of 10,000 kW-hr of electricity per year over the older machines. After a period of 10 years neither option (new or old) will have any market value. If you use a before tax MARR of 6% and pay \$0.075 per kilowatt-hour, would you replace the old machines today with the new one? **(03)**
- 6b)** With an example differentiate between outsider's point of view method and insider's point of view method, as applied to replacement analysis. **(03)**
- 6c)** Don Garlits is a landscaper. He is considering the purchase of a new commercial lawn mower, either, the Atlas or the Zippy. The minimum attractive rate of return is 6%, and the table provides all the necessary information for the two machines. **(04)**

	Atlas	Zippy
Initial cost (\$)	6,700	16,900
Annual operating cost (\$)	1,500	1,200
Annual benefits (\$)	4,000	4,500
Salvage value (\$)	1,000	3,500
Useful life in years	3	6
IRR	12%	8%

Use incremental rate of return analysis to decide which machine to purchase.

6%

Compound Interest Factors

6%

n	Single Payment		Uniform Payment Series				Arithmetic Gradient		n
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
	Find F Given P F/P	Find P Given F P/F	Find A Given F A/F	Find A Given P A/P	Find F Given A F/A	Find P Given A P/A	Find A Given G A/G	Find P Given G P/G	
1	1.060	.9434	1.0000	1.0600	1.000	0.943	0	0	1
2	1.124	.8900	.4854	.5454	2.060	1.833	0.485	0.890	2
3	1.191	.8396	.3141	.3741	3.184	2.673	0.961	2.569	3
4	1.262	.7921	.2286	.2886	4.375	3.465	1.427	4.945	4
5	1.338	.7473	.1774	.2374	5.637	4.212	1.884	7.934	5
6	1.419	.7050	.1434	.2034	6.975	4.917	2.330	11.459	6
7	1.504	.6651	.1191	.1791	8.394	5.582	2.768	15.450	7
8	1.594	.6274	.1010	.1610	9.897	6.210	3.195	19.841	8
9	1.689	.5919	.0870	.1470	11.491	6.802	3.613	24.577	9
10	1.791	.5584	.0759	.1359	13.181	7.360	4.022	29.602	10
11	1.898	.5268	.0668	.1268	14.972	7.887	4.421	34.870	11
12	2.012	.4970	.0593	.1193	16.870	8.384	4.811	40.337	12
13	2.133	.4688	.0530	.1130	18.882	8.853	5.192	45.963	13
14	2.261	.4423	.0476	.1076	21.015	9.295	5.564	51.713	14
15	2.397	.4173	.0430	.1030	23.276	9.712	5.926	57.554	15
16	2.540	.3936	.0390	.0990	25.672	10.106	6.279	63.459	16
17	2.693	.3714	.0354	.0954	28.213	10.477	6.624	69.401	17
18	2.854	.3503	.0324	.0924	30.906	10.828	6.960	75.357	18

8%

Compound Interest Factors

8%

n	Single Payment		Uniform Payment Series				Arithmetic Gradient		n
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
	Find F Given P F/P	Find P Given F P/F	Find A Given F A/F	Find A Given P A/P	Find F Given A F/A	Find P Given A P/A	Find A Given G A/G	Find P Given G P/G	
1	1.080	.9259	1.0000	1.0800	1.000	0.926	0	0	1
2	1.166	.8573	.4808	.5608	2.080	1.783	0.481	0.857	2
3	1.260	.7938	.3080	.3880	3.246	2.577	0.949	2.445	3
4	1.360	.7350	.2219	.3019	4.506	3.312	1.404	4.650	4
5	1.469	.6806	.1705	.2505	5.867	3.993	1.846	7.372	5
6	1.587	.6302	.1363	.2163	7.336	4.623	2.276	10.523	6
7	1.714	.5835	.1121	.1921	8.923	5.206	2.694	14.024	7
8	1.851	.5403	.0940	.1740	10.637	5.747	3.099	17.806	8
9	1.999	.5002	.0801	.1601	12.488	6.247	3.491	21.808	9
10	2.159	.4632	.0690	.1490	14.487	6.710	3.871	25.977	10

10%

Compound Interest Factors

10%

n	Single Payment		Uniform Payment Series				Arithmetic Gradient		n
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
	Find F Given P F/P	Find P Given F P/F	Find A Given F A/F	Find A Given P A/P	Find F Given A F/A	Find P Given A P/A	Find A Given G A/G	Find P Given G P/G	
1	1.100	.9091	1.0000	1.1000	1.000	0.909	0	0	1
2	1.210	.8264	.4762	.5762	2.100	1.736	0.476	0.826	2
3	1.331	.7513	.3021	.4021	3.310	2.487	0.937	2.329	3
4	1.464	.6830	.2155	.3155	4.641	3.170	1.381	4.378	4
5	1.611	.6209	.1638	.2638	6.105	3.791	1.810	6.862	5
6	1.772	.5645	.1296	.2296	7.716	4.355	2.224	9.684	6
7	1.949	.5132	.1054	.2054	9.487	4.868	2.622	12.763	7
8	2.144	.4665	.0874	.1874	11.436	5.335	3.004	16.029	8
9	2.358	.4241	.0736	.1736	13.579	5.759	3.372	19.421	9
10	2.594	.3855	.0627	.1627	15.937	6.145	3.725	22.891	10