Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2724609 **Date: 31/05/2016**

Subject Name: Engineering Economics & Financial Management

Time:10:30 am to 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of factor tables is permissible.**

Q.1 **(a)** Attempt the following questions. (Any three) **07**

i. Explain the concept of Time Value of money.

ii. Explain significant features of Proprietary business format.

iii. Explain: Profit – Volume ratio

iv. Explain: Budgeting and its requirement

(b) i. A person invests 1,00,000 in term deposit now at 10% rate of interest. How much money will be compound accumulated after 8 years? **07**

ii. If a person is investing Rs. 25,000 uniformly every year for 10 years, what will be the compound amount accumulated after 10 years, if the 10% interest rate is applicable?

iii. How much money should be invested now, if a person needs Rs. 5,00,000 after 5 years, if rate of interest is 10%.

Q.2 **(a)** Prepare a balance sheet of Amin Industries Pvt. Ltd. with the help of following financial data as on 31/3/2016. Calculate the working capital and current liquidity ratio. **07**

Details	***Amount in Rs. (lacs)***
• Cash on hand ----------	25
• Machinery of plant ----------	110
• Vehicles ----------	30
• Work in Progress ----------	24
• Share capital ----------	100
• Cash in bank account----------	32
• Raw material stock ----------	15
• Finished goods stock ----------	16
• Payment to be made in 45 days ----------	22
• Payment to be received from customers (30 days) --	10
• Loan taken from bank for 5 years ----------	60
• Building ----------	45
• Share premium account ----------	40
• Reserves ----------	50
• Loan given for 5 years ----------	13

(b) A Works Manager is trying to decide between two machines with the estimates presented below. **07**

	Machine A	Machine B
First cost, P (Rs)	4,50,000	6,00,000
Annual Operating Cost, (AOC)	30,000	25,000
Salvage Value (SV), Rs.	50,000	60,000
Life, (years)	5	10

Determine which machine should be selected on the basis of **Present Worth (PW) Analysis**, if rate of interest is 10% / year.

OR

(b) A city engineer is considering two alternatives for the local water supply. **07**

First alternative: The construction of earthen Dam on a near by river, which has highly variable flow. The dam will form a reservoir, so the city may have a dependable source of water. Initial cost = Rs. 80,00,000; Annual upkeep cost = Rs. 25,000; Life of dam is expected to last infinitely.

Second alternative: Drilling of wells as needed and construct pipelines for transport of water. Average 10 wells are required.

Initial cost = 75,000 per well, including pipe line Average life = 5 years; Annual operating cost = Rs.15,000 per well. If i = 10% per year, which alternative should be selected on the basis of **Capitalized Cost**?

Q.3 **(a)** Mr. Mahesh is investing Rs.5000 now in common stock that is expected to yield Rs.100/year for 10 years and Rs.7000 at the end of 10 years, what is the **rate of return**? **07**

(b)
i. What is depreciation? What are different methods of depreciation? **07**
ii. The cost of a car is Rs. 6,00,000, scrap value is Rs. 50,000, estimated life = 10 years, Depreciation rate = 10%. Calculate the annual depreciation by Straight line method.

OR

Q.3 **(a)** Select the better of the two alternatives shown below using an interest rate of 10% per year and the B/C ratio method. Assume one of the alternatives must be selected. **07**

	Alternative X	**Alternative Y**
Initial cost, Rs.	3,20,000	5,40,000
Annual M & O cost, Rs.	35,000	25,000
Annual benefit, Rs.	1,10,000	1,50,000
Annual disbenefits, Rs.	20,000	45,000
Life, years	10	20

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(b)
i. Explain Break Even Analysis with graphical representation. **07**
ii. A manufacturer of motor cycles buys side box at Rs. 240 each. In case he makes it himself, the fixed cost and variable cost would be Rs.3,00,000 and Rs.90 per side box, respectively. Whether manufacturer should make or buy the side box, if there is a demand for 2500 side boxes? Give your answer using break even analysis method.

Q.4 **(a)** A small engineering company has following department-wise actual costing. Apportion the overheads to the workshops. Apportion of administration should be on purchase and apportion of purchase & stores should be on two shops. **07**

Cost Centers	Department Overheads	No. of people	Direct Material Cost
Administration	50,000	2	-
Purchase & stores	60,000	3	-
Fabrication shop	80,000	12	2,50,000
Painting shop	70,000	10	1,50,000
	2,60,000	*27*	*4,00,000*

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(b) What are various modes of long term financing? Explain briefly. **07**

OR

Q.4 **(a)** A product is manufactured in the batch of 200 quantities. The direct material cost is Rs. 3400, and direct labour cost is Rs. 2600. Consider overheads as 50% of direct costs, and marketing expenses are Rs.25 / product. If selling price is Rs.100 per product, then find the profit / product. **07**

(b) What is working capital? What is its significance? Why optimum level of current assets is preferable? **07**

Q.5 **(a)** Explain: Law of demand, law of supply and equilibrium condition of both. **07**

(b) Explain: Division of labour. What are its merits and demerits? **07**

OR

Q.5 **(a)** Explain: Elasticity of Demand. **07**

(b) Explain: Perfect competition, monopoly and oligopoly. **07**

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10% **Table 15** Discrete cash flow: compound interest factors **10%**

	Single Payments		Uniform-Series Payments				Uniform Gradient	
n	Compound Amount *F/P*	Present Worth *P/F*	Sinking Fund *A/F*	Compound Amount *F/A*	Capital Recovery *A/P*	Present Worth *P/A*	Gradient Present Worth *P/G*	Gradient Annual Series *A/G*
1	1.1000	0.9091	1.00000	1.0000	1.10000	0.9091		
2	1.2100	0.8264	0.47619	2.1000	0.57619	1.7355	0.8264	0.4762
3	1.3310	0.7513	0.30211	3.3100	0.40211	2.4869	2.3291	0.9366
4	1.4641	0.6830	0.21547	4.6410	0.31547	3.1699	4.3781	1.3812
5	1.6105	0.6209	0.16380	6.1051	0.26380	3.7908	6.8618	1.8101
6	1.7716	0.5645	0.12961	7.7156	0.22961	4.3553	9.6842	2.2236
7	1.9487	0.5132	0.10541	9.4872	0.20541	4.8684	12.7631	2.6216
8	2.1436	0.4665	0.08744	11.4359	0.18744	5.3349	16.0287	3.0045
9	2.3579	0.4241	0.07364	13.5795	0.17364	5.7590	19.4215	3.3724
10	2.5937	0.3855	0.06275	15.9374	0.16275	6.1446	22.8913	3.7255
11	2.8531	0.3505	0.05396	18.5312	0.15396	6.4951	26.3963	4.0641
12	3.1384	0.3186	0.04676	21.3843	0.14676	6.8137	29.9012	4.3884
13	3.4523	0.2897	0.04078	24.5227	0.14078	7.1034	33.3772	4.6988
14	3.7975	0.2633	0.03575	27.9750	0.13575	7.3667	36.8005	4.9955
15	4.1772	0.2394	0.03147	31.7725	0.13147	7.6061	40.1520	5.2789
16	4.5950	0.2176	0.02782	35.9497	0.12782	7.8237	43.4164	5.5493
17	5.0545	0.1978	0.02466	40.5447	0.12466	8.0216	46.5819	5.8071
18	5.5599	0.1799	0.02193	45.5992	0.12193	8.2014	49.6395	6.0526
19	6.1159	0.1635	0.01955	51.1591	0.11955	8.3649	52.5827	6.2861
20	6.7275	0.1486	0.01746	57.2750	0.11746	8.5136	55.4069	6.5081
21	7.4002	0.1351	0.01562	64.0025	0.11562	8.6487	58.1095	6.7189
22	8.1403	0.1228	0.01401	71.4027	0.11401	8.7715	60.6893	6.9189
23	8.9543	0.1117	0.01257	79.5430	0.11257	8.8832	63.1462	7.1085
24	9.8497	0.1015	0.01130	88.4973	0.11130	8.9847	65.4813	7.2881
25	10.8347	0.0923	0.01017	98.3471	0.11017	9.0770	67.6964	7.4580
26	11.9182	0.0839	0.00916	109.1818	0.10916	9.1609	69.7940	7.6186
27	13.1100	0.0763	0.00826	121.0999	0.10826	9.2372	71.7773	7.7704
28	14.4210	0.0693	0.00745	134.2099	0.10745	9.3066	73.6495	7.9137
29	15.8631	0.0630	0.00673	148.6309	0.10673	9.3696	75.4146	8.0489
30	17.4494	0.0573	0.00608	164.4940	0.10608	9.4269	77.0766	8.1762
31	19.1943	0.0521	0.00550	181.9434	0.10550	9.4790	78.6395	8.2962
32	21.1138	0.0474	0.00497	201.1378	0.10497	9.5264	80.1078	8.4091
33	23.2252	0.0431	0.00450	222.2515	0.10450	9.5694	81.4856	8.5152
34	25.5477	0.0391	0.00407	245.4767	0.10407	9.6086	82.7773	8.6149
35	28.1024	0.0356	0.00369	271.0244	0.10369	9.6442	83.9872	8.7086
40	45.2593	0.0221	0.00226	442.5926	0.10226	9.7791	88.9525	9.0962
45	72.8905	0.0137	0.00139	718.9048	0.10139	9.8628	92.4544	9.3740
50	117.3909	0.0085	0.00086	1163.91	0.10086	9.9148	94.8889	9.5704
55	189.0591	0.0053	0.00053	1880.59	0.10053	9.9471	96.5619	9.7075
60	304.4816	0.0033	0.00033	3034.82	0.10033	9.9672	97.7010	9.8023
65	490.3707	0.0020	0.00020	4893.71	0.10020	9.9796	98.4705	9.8672
70	789.7470	0.0013	0.00013	7887.47	0.10013	9.9873	98.9870	9.9113
75	1271.90	0.0008	0.00008	12709	0.10008	9.9921	99.3317	9.9410
80	2048.40	0.0005	0.00005	20474	0.10005	9.9951	99.5606	9.9609
85	3298.97	0.0003	0.00003	32980	0.10003	9.9970	99.7120	9.9742
90	5313.02	0.0002	0.00002	53120	0.10002	9.9981	99.8118	9.9831
95	8556.68	0.0001	0.00001	85557	0.10001	9.9988	99.8773	9.9889
96	9412.34	0.0001	0.00001	94113	0.10001	9.9989	99.8874	9.9898
98	11389	0.0001	0.00001		0.10001	9.9991	99.9052	9.9914
100	13781	0.0001	0.00001		0.10001	9.9993	99.9202	9.9927

Factors table for 10% Interest Rate