Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER II EXAMINATION – SUMMER 2017

Subject Code: 2724609 **Date:30/05/2017**

Subject Name: Engineering Economics & Financial Management

Time:02:30 PM to 05:00 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)** Define the following terminologies. **07**

(i) Rate of Return, (ii) Net cash flow, (iii) Uniform gradient, (iv) Sinking fund factor, (v) Short run production, (vi) Perfect market, (vii) Inflation,

(b) Solve following problems using factor table. Draw cash flow diagram in each case. **07**

i. A person invests 2,00,000 in term deposit now at 10% rate of interest. How much money will be compound accumulated after 5 years?

ii. If a person is investing Rs. 20,000 uniformly every year for 15 years, what will be the compound amount accumulated, if the 10% interest rate is applicable?

iii. How much money should be invested now, if a person needs Rs. 6,00,000 after 8 years, if rate of interest is 10%.

Q.2 **(a)** Prepare trading account, profit and loss account and balance sheet of Amin Industries Pvt. Ltd. with the help of following trial balance as on 31/3/2017. **07**

Name of Account	*Debit*	*Credit*
Capital Drawings	15000	139000
Adjusted Purchase – Sales	500000	850000
Goods return	40000	
Discount	4000	6000
Rent	5000	
Debtors – Creditors	100000	80000
Commission	6000	
Bills	15000	25000
Cash balance	10000	
Bank balance	25000	
Building	200000	
Furniture	30000	
Machinery	100000	
Wages	5000	
Carriage inward	5000	
10% Bank loan & interest	10000	100000
Closing stock	30000	
Office Expenses	100000	
Total	12,00,000	12,00,000

(b) An industrialist is trying to select one alternative out of two machines with the estimates presented below. **07**

	Machine A	Machine B
First cost, P (Rs)	2,50,000	4,00,000
Annual Operating Cost, (AOC)	40,000	25,000
Salvage Value (SV), Rs.	50,000	70,000
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) Calculate the **capitalized cost** of a project that has an initial cost of Rs.2,00,000 and an additional investment cost of Rs.40,000 after 9 years. The annual operating cost will be Rs.6000 for the first 4 years and Rs.9000 thereafter. In addition, there is expected to be recurring major rework cost of Rs.20,000 every 12 years. Assume that interest rate, i = 10% per year. **07**

Q.3 **(a)** Mr. Mukesh Patel is investing Rs.50,000 now in common stock that is expected to yield Rs.4000/year for 10 years and Rs.25,000 at the end of 10 years, what is the **rate of return**? **07**

(b) i. What is depreciation? Explain reducing balance method. **07**

ii. The cost of a car is Rs. 8,00,000, scrap value is Rs. 1,00,000, estimated life = 10 years, Depreciation rate = 10%. Calculate the annual depreciation by straight line method. Draw line diagram showing first 5 years' depreciation.

OR

Q.3 **(a)** A small industry is trying to decide between purchase of hardness testing machine for checking the hardness or sending the samples to a private lab. In order to equip the tester, an initial expenditure of Rs. 2,00,000 will be required. **07**

In addition, a full time technician will have to be hired at a cost of Rs. 5000 per month. A total of 500 analytical tests are required each month.

If the analysis are done in-house, the cost per sample will average Rs.5, but if the samples are sent to an outside lab, the average cost will be Rs.30

The equipment purchased for the lab is expected to have a useful life of 5 years. If the utility uses an interest rate of 10%, determine the B/C ratio and modified B/C ratio for the project.

(b) i. Explain Break Even Analysis with graphical representation. **07**

ii. A manufacturer of motor cycles is selling accessories at Rs. 1000 / unit set. In case industry makes them in-house, the fixed cost and variable cost would be Rs.8,00,000 and Rs.600 / unit set respectively. Whether manufacturer should make or buy the accessories, if there is a demand for 2400 set of accessories? Evaluate answer using **Break Even Analysis**.

Q.4 **(a)** A Geminy 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
Office	40,000	2	-
Purchase & stores	60,000	4	-
Press shop	80,000	10	3,00,000
Spray Painting shop	70,000	10	1,00,000
	2,50,000	*26*	*4,00,000*

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

OR

Q.4 **(a)** Explain financial environment, including investment sector, financial broker, secondary market, saving sector and financial intermediaries. **07**

(b) (i) What is budget? What are the objectives of formulating budget? **07**

(ii) Explain the significant features of partnership form of business.

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: Law of diminishing marginal utility with graphical diagram. **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