Answer The Following Questions

Question One (20Marks)

1-How much money would be accumulated in 6 years if a person deposited $500 now and the deposits increases by $50 per year for the next 6 years?.Assume that the intrest rate (*i*) is 15% per year and then draw the cash-flow diagram. (8 Marks)

2- Assume that a company is producing and selling 5,000 units of its product per year, and that the following data are associated with its operations:
Fixed costs $ 3,000, Variable costs are $ 0.5 per unit, and Selling price $ 1 per unit.
a) How much profit or loss is expected at this volume?
b) What effect will be on the profit if the fixed costs are reduced to$ 2,000.
c- Assume that fixed costs remains at $ 3,000 and that the variable costs per unit increased to$ 0.75. What volume would be necessary to make a profit of $ 1,000.

Question Two (25Marks)

1-What is Inventory ? Find out the Economic Order Quantity (E.O.Q);and the Economic Production Quantity (E.P.Q) . (5 Marks)

2-A company has purchased a numerically control machine for $150,000. It is estimated that it will have a salvage value of 50,000 four years from new. What are must be, using the declining–balance method of depreciation, so that the book value will be equal to its salvage value at the end of its life?. Compare these figures with Straight line(S.L) and sum-of - years digits methods? (10 Marks)

3-A manger is comparing three machines for purchase. Machine A has a purchase cost of $12,000 and a variable cost per unit estimated at $ 5. Machine B has a purchase cost of $16,000 and a variable cost per unit estimated at $ 3.Machine C has a purchase cost of $20,000 and a variable cost per unit estimated at $2.5 . What is the cost equalization quantities and what decision rule should be applied to the purchase? (10 Marks)

COMPOUND INTEREST FACTORS

[redacted]

N	Single Payment: Compound Amount F/P	Single Payment: Present Worth P/F	Single Payment: P/F	Uniform Series: Compound Amount F/A	Uniform Series: F/A	Uniform Series: Present Worth P/A	Uniform Series: P/A	Uniform Series: Sinking Fund A/F	Uniform Series: Capital Recovery A/P	Gradient Series: Uniform Series A/G	Gradient Series: Present Worth P/G	N
1	1.150	0.8696	0.9333	1.000	1.070	0.870	0.933	1.0000	1.1500	0.000	0.000	1
2	1.323	0.7561	0.8115	2.150	2.307	1.626	1.745	0.4651	0.6151	0.465	0.756	2
3	1.521	0.6575	0.7057	3.473	3.727	2.283	2.450	0.2880	0.4380	0.907	2.071	3
4	1.749	0.5718	0.6136	4.993	5.359	2.855	3.064	0.2003	0.3503	1.326	3.786	4
5	2.011	0.4972	0.5336	6.742	7.236	3.352	3.598	0.1483	0.2983	1.723	5.775	5
6	2.313	0.4323	0.4640	8.754	9.395	3.784	4.062	0.1142	0.2642	2.097	7.937	6
7	2.660	0.3759	0.4035	11.067	11.877	4.160	4.465	0.0904	0.2404	2.450	10.192	7
8	3.059	0.3269	0.3508	13.727	14.732	4.487	4.816	0.0729	0.2229	2.781	12.481	8
9	3.518	0.2843	0.3051	16.786	18.015	4.772	5.121	0.0596	0.2096	3.092	14.755	9
10	4.046	0.2472	0.2653	20.304	21.791	5.019	5.386	0.0493	0.1993	3.383	16.979	10
11	4.652	0.2149	0.2307	24.349	26.133	5.234	5.617	0.0411	0.1911	3.655	19.129	11
12	5.350	0.1869	0.2006	29.002	31.126	5.421	5.816	0.0345	0.1845	3.908	21.185	12
13	6.153	0.1625	0.1744	34.352	36.868	5.583	5.992	0.0291	0.1791	4.144	23.135	13
14	7.076	0.1413	0.1517	40.505	43.472	5.724	6.144	0.0247	0.1747	4.362	24.972	14
15	8.137	0.1229	0.1319	47.580	51.066	5.847	6.276	0.0210	0.1710	4.565	26.693	15
16	9.358	0.1069	0.1147	55.717	59.799	5.954	6.390	0.0179	0.1679	4.752	28.296	16
17	10.761	0.0929	0.0997	65.075	69.842	6.047	6.490	0.0154	0.1654	4.925	29.783	17
18	12.375	0.0808	0.0867	75.836	81.392	6.128	6.577	0.0132	0.1632	5.084	31.156	18
19	14.232	0.0703	0.0754	88.212	94.674	6.198	6.652	0.0113	0.1613	5.231	32.421	19
20	16.367	0.0611	0.0656	102.444	109.948	6.259	6.718	0.0098	0.1598	5.365	33.582	20
21	18.822	0.0531	0.0570	118.810	127.513	6.312	6.775	0.0084	0.1584	5.488	34.645	21
22	21.645	0.0462	0.0496	137.632	147.714	6.359	6.824	0.0073	0.1573	5.601	35.615	22
23	24.891	0.0402	0.0431	159.276	170.941	6.399	6.868	0.0063	0.1563	5.704	36.499	23
24	28.625	0.0349	0.0375	184.168	197.659	6.434	6.905	0.0054	0.1554	5.798	37.302	24
25	32.919	0.0304	0.0326	212.793	228.381	6.464	6.938	0.0047	0.1547	5.883	38.031	25
26	37.857	0.0264	0.0284	245.712	263.711	6.491	6.966	0.0041	0.1541	5.961	38.692	26
27	43.535	0.0230	0.0247	283.569	304.341	6.514	6.991	0.0035	0.1535	6.032	39.289	27
28	50.066	0.0200	0.0214	327.104	351.066	6.534	7.012	0.0031	0.1531	6.096	39.828	28
29	57.575	0.0174	0.0186	377.170	404.799	6.551	7.031	0.0027	0.1527	6.154	40.315	29
30	66.212	0.0151	0.0162	434.745	466.992	6.566	7.047	0.0023	0.1523	6.207	40.753	30
31	76.144	0.0131	0.0141	500.957	537.654	6.579	7.061	0.0020	0.1520	6.254	41.147	31
32	87.565	0.0114	0.0123	577.100	619.375	6.591	7.073	0.0017	0.1517	6.297	41.501	32
33	100.700	0.0099	0.0107	664.666	713.355	6.600	7.084	0.0015	0.1515	6.336	41.818	33
34	115.805	0.0086	0.0093	765.365	821.431	6.609	7.093	0.0013	0.1513	6.371	42.103	34
35	133.176	0.0075	0.0081	881.170	945.719	6.617	7.101	0.0011	0.1511	6.402	42.359	35
40	267.864	0.0037	0.0040	1779.090	1909.415	6.642	7.128	0.0006	0.1506	6.517	43.283	40
45	538.769	0.0019	0.0020	3585.128	3847.752	6.654	7.142	0.0003	0.1503	6.583	43.805	45
50	1083.657	0.0009	0.0010	7217.716	7746.440	6.661	7.148	0.0001	0.1501	6.620	44.096	50
55	2179.622	0.0005	0.0005	14524.148	15588.093	6.664	7.152	0.0001	0.1501	6.641	44.256	55
60	4383.999	0.0002	0.0002	29219.992	31360.460	6.665	7.153	0.0000	0.1500	6.653	44.343	60
65	8817.787	0.0001	0.0001	58778.583	63084.322	6.666	7.154	0.0000	0.1500	6.659	44.390	65

Question Three (25 Marks)

1-From the data below. determine the best forecasting method (technique) by using the smallest mean absolute deviations for the last period, 2-Months Moving Average and Exponentially Weighted Moving Average(EWMA) demand forecasting methods. What is the forecast for month seven?(Assume a= 0.2, and, $\bar{Y}_0$=30). (12 Marks)

Month	1	2	3	4	5	6
Demand	30	40	40	50	55	60

2- Use the graphical method of linear programming to solve the following problem:

$$\text{Minimize } Z = 4x_1 + 3x_2,$$

Subject to

$$2x_1 + x_2 \leq 10, \quad 2x_2 - 3x_1 \leq 6, \quad x_1 + x_2 \geq 6$$

$$\text{and,} \quad x_1 \geq 0, \quad x_2 \geq 0$$

Question Four (30Marks)

1)-Name the several areas of PERT applications, and what is the purpose of activities analysis? (5 Marks)

2)-The sequence and activity times for a project is given in the table below. The completion time is 36 days after the project begins. Perform the following:-

a) **Draw the PERT network, labeling activities, and compute ES,EF,LS, and LF.**
b) **Determine the critical path as well as the total slack and free slack.**
c) **What is the probability the project will be completed within 34 days?**
d) **What is the probability the-project will require more than 39 days?**

Activity	Immediate predecessor	Expected time t_e	Optimistic time a	Most likely time m	Pessimistic time b
A	-	8	7	8	9
B	-	12	5	10	27
C	-	7	5	7	9
D	A	3	1	3	5
E	A	12	5	13	15
F	A	5	4	4.5	8
G	C, F	4	3	3.75	6
H	C,F	2	1	2	3
I	B,D	7	4	6	14
J	B	9	6	8.5	14
K	E,G,I	6	4	6	8
L	H,K	10	3	10.5	15
M	J,L	0	0	0	0

This exam measures the following ILOs					
Question Number	Q1-1	Q1-2	Q2	Q3	Q4
Skills	a5-1	a20-1	b9-1	b10-1	c1-1
	Knowledge &Understanding Skills		Intellectual Skills		Professional skills

Areas of a standard normal distribution.

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2234
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2703	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3862	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4962	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986