Question Paper

Exam Date & Time: 06-Jun-2019 (09:30 AM - 12:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENES IV SEMESTER B.Sc.(Applied Sciences) IN ENGINEERING END SEMESTER THEORY EXAMINATION-APRIL/ MAY 2019

ENGINEERING ECONOMICS AND MANAGEMENT [IHS 241]

Marks: 100

Duration: 180 mins.

Answer 5 out of 8 questions.

¹⁾ A finance company advertises two investment plans. In plan 1, the company ⁽¹⁰⁾ pays Rs. 12,000 after 15 years for every Rs 1,000 invested now. In plan 2,

^{A)} for every Rs 1,000 invested, the company pays Rs. 4,000 at the end of the 10th year and Rs 4,000 at the end of 15th year. Select the best investment plan from the investor's point of view at i = 12%, compounded annually. [Show calculations, Draw cashflow diagram-with explanation]

COMPOUND INTEREST TABLES

12%				Compound In	nterest Factors				12%
	Single Payment			Uniform Pa	Arithmetic Gradient				
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
n	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	п
1	1.120	.8929	1.0000	1.1200	1.000	0.893	0	0	1
2	1.254	.7972	.4717	.5917	2,120	1.690	0.472	0.797	2
3	1.405	.7118	.2963	.4163	3.374	2.402	0.925	2.221	3
4	1.574	.6355	.2092	.3292	4.779	3.037	1.359	4.127	
5	1.762	.5674	.1574	.2774	6.353	3.605	1.775	6.397	5
6	1.974	.5066	.1232	.2432	8.115	4.111	2.172	8.930	6
7	2.211	.4523	.0991	,2191	10.089	4.564	2.551	11.644	7
8	2.476	.4039	.0813	.2013	12.300	4.968	2.913	14.471	8
9	2.773	.3606	.0677	.1877	14.776	5.328	3.257	17.356	9
10	3.106	.3220	.0570	.1770	17.549	5.650	3.585	20.254	10
11	3,479	.2875	.0484	.1684	20.655	5.938	3.895	23.129	11
12	3,896	2567	0414	.1614	24.133	6.194	4.190	25.952	12
13	4.363	.2292	.0357	.1557	28.029	6.424	4,468	28.702	13
14	4.887	.2046	.0309	.1509	32.393	6.628	4.732	31.362	14
15	5.474	.1827	.0268	.1468	37.280	6.811	4.980	33.920	15
16	6 130	1631	0234	1434	42 753	6 974	5.215	36367	16
17	6 866	1456	0205	1405	48 884	7.120	5.435	38,697	17
18	7.690	1300	0179	1379	55.750	7.250	5.643	40.908	18
19	8 613	1161	0158	1358	63.440	7.366	5.838	42,998	19
20	9.646	.1037	.0139	.1339	72.052	7.469	6.020	44.968	20
31	10 504	0036	0122	1222	91.600	7.562	6 101	46.910	21
22	12.100	0826	0108	1308	92 503	7.645	6 351	40.819	22
22	13.552	0728	00056	1206	104 603	7 718	6 501	50 178	21
24	15.552	0650	00846	1296	118 155	7 784	6 641	51 603	24
25	17,000	0588	00750	1275	133,334	7.843	6.771	53.105	25
3/	10.040	0636	00668	1267	160.224	7 906	6 80.7	64.419	36
20	21,225	0460	.00003	.1207	160.334	7.890	2.005	55,637	20
20	21.545	0410	00524	1252	100.600	7 084	7.110	56 767	28
20	25.664	0374	00466	1247	214 583	8 022	7 207	57.814	29
30	29.960	0334	.00414	.1241	241,333	8.055	7.297	58,782	30
34	27.700	0000	00360	1227	271 202	8 085	7 201	80.676	31
31	33,555	0298	00309	1237	2/1.293	8.085	7.301	60.501	31
34	42,002	.0200	00326	1220	347 470	8 135	7,530	61 361	33
3.5	42,092	0212	00292	1225	384 521	8157	7 506	61.061	34
35	52,800	0189	00232	1223	431.663	8.176	7.658	62.605	35
30	02.055	.0107	00100	.1245	307,000	0.170	7,000	62.000	40
40	93.051	.0107	.00130	.1213	1 269 2	8.244	7.699	03.110	40
45	163.988	.00610	.00074	.1207	1 358.2	8.285	8.057	67.763	45
50	289,002	/00340	00024	1204	4 236.0	8.304	8.100	69.402	50
55	807.507	00111	00013	1202	7 471 6	8 374	8 266	68 810	60
00	166168			.1201	/ 4/1/0	0.324	0.200	00.010	00
65	1 581.9	.00063	.00008	.1201	13 173.9	8.328	8.292	69.058	65
70	2 787.8	.00036	.00004	.1200	23 223.3	8.330	8.308	69.210	70
75	4 913.1	.00020	.00002	.1200	40 933.8	8.332	8.318	69.303	75
50	8 658.5	.00012	.00001	.1200	127 143.7	8.332	8.324	60 202	80
85	15 259.2	.00007	100001	.1200	127 151.7	8.333	8.328	09.393	85
90	26 891.9	.00004		.1200	224 091.1	8.333	8.330	69.414	90
95	47 392.8	.00002		.1200	394 931.4	8.333	8.331	69.426	95
100	83 522.3	10000.		.1200	696 010.5	8.333	8.332	69.434	100

B)

A person is planning for his retired life. He has 10 more years of service. He ⁽¹⁰⁾ would like to deposit 20% of his salary, which is Rs 4,000, at the end of the first year, and thereafter he wishes to deposit the amount with an annual increase of Rs 500 for the next 9 years with an interest rate of 15%. Find the total amount at the end of the 10th year of the above series. [Show calculations, Draw cashflow diagram-with explanation]

15%				Compound In	terest Factors				15%
	Single Payment			Uniform Pa	ayment Series	Series		: Gradient	
	Compound Amount Factor	Present Worth Factor	Sinking Fund Factor	Capital Recovery Factor	Compound Amount Factor	Present Worth Factor	Gradient Uniform Series	Gradient Present Worth	
n	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	п
1	1.150	8695	1.0000	1.1500	1.000	0.870	0	0	1
2	1.322	.7561	.4651	.6151	2.150	1.626	0.465	0.756	2
3	1.521	.6575	.2880	.4380	3.472	2.283	0.907	2.071	3
4	1.749	.5718	.2003	.3503	4.993	2.855	1.326	3.780	4
5	2.011	.4972	.1483	.2983	6.742	3.352	1.723	5.(15	
6	2.313	.4323	.1142	.2642	8.754	3.784	2.097	7.937	6
7	2,660	.3759	.0904	,2404	11.067	4.160	2.450	10,192	7
8	3.059	.3269	.0729	.2229	13.727	4.487	2.781	12.481	0
9	3.518	.2843	.0596	.2096	16.786	4.772	3.092	16.970	10
10	4.046	.2472	.0493	.1993 .	20.304	5.019	3.383	10.373	- 11
11	4.652	.2149	.0411	.1911	24.349	5.234	3.655	19.129	11
12	5.350	,1869	.0345	.1845	29.002	5.421	3.908	21.185	12
13	6.153	.1625	.0291	.1791	34.352	5.583	4.144	23.133	14
14	7.076	.1413	.0247	.1747	40.505	5.724	4.565	26.693	15
15	8.137	.1229	.0210	.1710	47.580	3.847	4.303	20.095	16
16	9.358	.1069	.0179	.1679	55.717	5.954	4.752	28.290	10
17	10.761	.0929	.0154	.1654	65.075	6.047	4.925	29.765	18
18	12.375	.0808	.0132	.1632	75.836	6.128	5.084	32.421	10
19	14.232	.0703	.0113	.1613	88.212	6.198	\$ 365	33 582	20
20	16.367	.0611	.00976	.1598	102.444	0.239	5.302	24.648	31
21	18.822	.0531	.00842	.1584	118.810	6.312	5,488	34.045	21
22	21.645	.0462	.00727	.1573	137.632	6.359	5.001	35.613	23
23	24.891	.0402	.00628	.1563	159.276	6.399	5.704	37 302	24
24	28.625	.0349	.00543	.1554	154.108	6.464	5.883	38.031	25
25	32.919	.0304	.00470	.1547	212.793	0.404	5.065	30.603	26
26	37.857	.0264	.00407	.1541	245.712	6.491	5.961	38.092	27
27	43.535	.0230	.00353	.1535	283.569	6.514	6.005	39,209	28
28	50.066	.0200	.00306	.1531	327.104	6 551	6154	40.315	29
29	57.575	.0174	.00265	.1527	434 745	6.566	6.207	40.753	30
30	66.212	.0151	30230	1323	404,740	6.670	6 254	41.147	31
31	76.144	.0131	.00200	.1520	500.957	6.501	6 297	41 501	32
32	87.555	.0114	.00173	.1517	577.100	6.600	6 336	41.818	33
33	100.700	.00993	.00150	.1313	265 365	6.609	6.371	42,103	34
34	115.805	.00864	00113	1511	881.170	6.617	6.402	42.359	35
35	133.176	.00751	30/113	.1.511	1 220 1	6.643	6 517	43 283	40
40	267.864	.00373	.00056	.1506	2 595 1	6.654	6.583	43,805	45
45	538.769	.00186	.00028	.1503	7 217 7	6.661	6.620	44.096	50
50	1 083.7	.00092	00007	1501	14 524.1	6.664	6.641	44.256	55
55	2 179.0	.000+0	00003	1500	29 220.0	6.665	6.653	44.343	60
00	4 384.0	0.00123	00000	1500	59 779 6	6.666	6.659	44.390	65
65	8 817.8	.00011	.00002	1500	118 231 5	6.666	6.663	44,416	70
70	17 735.7	.00006	100001	1500	237 812.5	6.666	6.665	44.429	75
75	35 672.9	.00003		1500	478 332.6	6.667	6,665	44.436	80
80	71 750.9	00001		1500	962 104.4	6.667	6.665	44.440	85

2)

A)

Raja Constructions has to replace a Concrete mixing facility after 15 years ⁽¹⁰⁾ at an outlay Rs. 15,00,000. It plans to deposit an equal amount at the end of every year for next 15 years at an interest rate of 15% compounded annually. Find the equivalent amount that must be deposited at the end of every year for next 15 years

[Write the formula, show calculations, draw cashflow diagram-with explanation]

COMPOUND INTEREST TABLES	
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15%				Compound Int	erest Factors				15%
	Single Pay	ment	Uniform Payment Series				Arithmetic Gradient		
	Compound Amount Factor Find F	Present Worth Factor Find P	Sinking Fund Factor Find A	Capital Recovery Factor Find A	Compound Amount Factor Find F	Present Worth Factor Find P	Gradient Uniform Series Find A	Gradient Present Worth Find P	
n	Given P F/P	Given F P/F	Given F A/F	Given P A/P	Given A F/A	Given A P/A	Given G A/G	Given G P/G	n
1	1.150	8695	1.0000	1.1500	1.000	0.870	0	0	1
2	1 322	7561	.4651	.6151	2.150	1.626	0.465	0.756	2
ã	1.521	6575	.2880	.4380	3.472	2,283	0.907	2.071	3
4	1.749	.5718	.2003	.3503	4.993	2.855	1.326	3.786	4
5	2.011	.4972	.1483	.2983	6.742	3.352	1.723	5.775	5
6	2313	4323	.1142	.2642	8.754	3.784	2.097	7.937	6
7	2.660	3759	.0904	,2404	11.067	4.160	2.450	10.192	7
8	3.059	.3269	.0729	.2229	13.727	4.487	2.781	12.481	8
0	3.518	.2843	.0596	.2096	16.786	4.772	3.092	14.755	9
10	4.046	.2472	.0493	.1993	20.304	5.019	3.383	16.979	10
11	4.652	2149	.0411	.1911	24.349	5,234	3.655	19.129	11
12	5 350	1869	.0345	.1845	29.002	5.421	3.908	21.185	12
13	6153	1625	.0291	.1791	34.352	5.583	4.144	23.135	13
14	7.076	.1413	.0247	.1747	40.505	5.724	4.362	24.972	14
15	8,137	.1229	.0210	.1710	47.580	5.847	4.565	26.693	15
16	0.159	1069	.0179	.1679	55.717	5.954	4.752	28.296	16
10	9.336	0929	0154	.1654	65.075	6.047	4,925	29.783	17
19	12 375	OSOR	.0132	.1632	75.836	6.128	5.084	31.156	18
10	14 232	0703	.0113	.1613	88,212	6.198	5.231	32.421	19
20	16.367	.0611	.00976	.1598	102.444	6.259	5.365	33.582	20
31	18 877	0531	00842	.1584	118.810	6.312	5,488	34.645	21
21	21.645	0462	00727	.1573	137.632	6.359	5.601	35.615	22
21	24 891	0402	.00628	.1563	159.276	6.399	5.704	36.499	23
24	28.625	.0349	.00543	.1554	184.168	6.434	5.798	37.302	24
25	32.919	.0304	.00470	.1547	212.793	6.464	5.883	38.031	25
26	37.857	0264	00407	.1541	245.712	6.491	5.961	38.692	26
20	43 535	0230	.00353	.1535	283.569	6.514	6.032	39.289	27
28	50.066	0200	.00306	.1531	327,104	6.534	6.096	39.828	28
20	57.575	.0174	.00265	.1527	377.170	6.551	6.154	40.315	29
30	66.212	.0151	.00230	.1523	434.745	6.566	6.207	40.753	30
21	76.144	0131	.00200	.1520	500.957	6.579	6.254	41.147	31
31	87 565	.0114	.00173	.1517	577.100	6.591	6.297	41.501	32
33	100,700	.00993	.00150	.1515	664.666	6.600	6.336	41.818	33
34	115,805	.00864	.00131	.1513	765.365	6.609	6.371	42.103	34
35	133.176	.00751	.00113	.1511	881.170	6.617	6.402	42.359	35
40	267 864	00373	.00056	.1506	1 779.1	6.642	6.517	43.283	40
45	538 769	00186	.00028	.1503	3 585.1	6.654	6.583	43.805	43
50	1 083.7	.00092	.00014	.1501	7 217.7	6.661	6.620	44.096	54
55	2 179.6	.00046	.00007	.1501	14 524.1	6.664	6.641	44.256	55
60	4 384.0	.00023	.00003	.1500	29 220.0	6.665	6.653	44.343	01
65	8 817.8	.00011	.00002	.1500	58 778.6	6.666	6.659	44.390	65
70	17 735.7	.00006	.00001	.1500	118 231.5	6.666	6.663	44,416	71
75	35 672.9	.00003		.1500	237 812.5	6.666	6.665	44.429	73
80	71 750.9	.00001		.1500	478 332.6	6.667	6,665	44.436	89
85	144 316.7	.00001		.1500	962 104.4	6.667	6.665	44,440	8

B) (i)Shetty Stationaries supplied 6000 pens at a price of Rs 16 per pen. When ⁽¹⁰⁾ price increases to Rs 10 per pen, the supply increases to 8000 pens. Find the elasticity of pens. [Write the formula, show calculations] (ii) Explain the concept of Equilibrium of Demand and Supply (20) 3) Explain the following terminologies (i) Straight Line Method of Depreciation with help of an example (ii) Declining Balance Method with help of an example (iii) Law of Demand and Law of Supply (iv) Price Elasticity of Demand (20) 4) Explain Strategic Planning. List out and explain the steps involved in Strategic Planning Process. 5) (20) Explain Off-the-Job Training Methods in detail 6) (10)Explain Likert's four systems of Management

	A)		
	B)	Differentiate between a Manager and a Leader	(10)
7)		Compare Maslow's and Herzberg's Theories	(10)
	A)		
	B)	Explain Mc. Gregor's X and Y Theories	(10)
8)		Define Communication. Explain the types of Communication?	(20)

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