Help Center

Question 2

10 / 10 pts

Using the following two relationships:

AW = CR + A of AOC
CR = -P(A/P,i,n) + S(A/F,i,n)

Calculate the Annual Worth (AW) based on the data for the following project:

Corporate MARR = 10%
Initial Investment Cost = $1,000,000
Anticipated Project Life = 10 years
Salvage Value at the end of 10 years = $100,000
Annual Cost of Operation = $50,000

10%

Compound Interest Factors

n	Single Payment: Compound Amount Factor Find F Given P F/P	Single Payment: Present Worth Factor Find P Given F P/F	Uniform Payment Series: Sinking Fund Factor Find A Given F A/F	Uniform Payment Series: Capital Recovery Factor Find A Given P A/P	Uniform Payment Series: Compound Amount Factor Find F Given A F/A	Uniform Payment Series: Present Worth Factor Find P Given A P/A	Arithmetic Gradient: Gradient Uniform Series Find A Given G A/G	Arithmetic Gradient: Gradient Present Worth Find P Given G P/G	n
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
11	2.853	.3505	.0540	.1540	18.531	6.495	4.064	26.396	11

10%

Help Center

Question 7

5 / 5 pts

The Rate of Return (ROR) for five different Mutually Exclusive project alternatives are provided in the table below.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
ROR (%)	17%	15%	21%	25%	19%

Which of the five Alternatives are economically desirable or should be accepted?

Note: This is a Multiple Answer Question. Select all of following options that are correct.

- [ ] Alt. 2
- [ ] Alt. 3
- [ ] Alt. 4
- [ ] Alt. 1
- [x] Not enough information is provided to determine the economically attractive Alternatives.
- [ ] Alt. 5

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Question 8

5 / 5 pts

The Rate of Return (ROR) for five different Mutually Exclusive project alternatives are provided in the table below.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
ROR (%)	17%	15%	21%	25%	19%
PV @ MARR = 18%	-$23,573	-$18,923	$5,678	$4,378	$2,457

Which of the five Alternatives provides the greatest economic value?

- Alt. 4
- Alt. 5
- Alt. 1
- **Alt. 3**
- Not enough information is provided to determine the most financially advantageous Alternative.
- Alt. 2

Help Center

ect

Question 3

0 / 10 pts

You have been asked to determine the most financially advantageous option for a new Product Packaging machine. It has been determined by the Marketing Department that product packaging actually makes a difference in the anticipated Yearly Revenue generated by this product and have been provided below. The director wants an **annual worth analysis** performed on the two final designs based on a project life of 21 years. Compare the alternatives at the MARR of 10% per year. (all dollar values are in thousands)

	Packaging Machine Design A	Packaging Machine Design B
First Cost, $	-900	-1,500
AOC, $ per year	-200	-300
Salvage value, $ (after 7 years of use)		200
Salvage value, $ (after 3 years of use)	100	
Salvage value, $ (after 2 years of use)	20	50
Annual revenue, $ per year	800	900
Life, years	3	7
AW ($K per year) for one full life cycle	268.312	312.967

10% Compound Interest Factors 10%

Single Payment | Uniform Payment Series | Arithmetic Gradient

Help Center

Question 10

2 / 5 pts

Which of the following were listed as potential Problems or Issues associated with Using a Rate of Return Approach to justifying single or multiple Mutually Exclusive projects?
Note: This is a Multiple Answer question. Please select all of the following options you think are correct?

- [ ] An incremental approach is required to reliably determine the best project when comparing multiple Mutually Exclusive projects with the ROR approach.
- [ ] You cannot rely on the best Mutually Exclusive project to have the highest ROR.
- [x] For any sequence of Net Cash Flows with more than one sign chance over the life of the project there may be more than one ROR value that satisfies the Rate of Return definition.
- [ ] This method assumes that any net positive cash flows are reinvested at the ROR rate. If the ROR rate is substantially larger than MARR, this might not be a realistic assumption.
- [x] The ROR calculations are typically more complex than the PW, AW, or FW methods and frequently require the use of trial and error techniques.

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Question 5

0 / 10 pts

You have been asked to determine the most financially advantageous option for a new Product Packaging machine. It has been determined by the Marketing Department that product packaging actually makes a difference in the anticipated Yearly Revenue generated by this product and have been provided below. The director now wants an **annual worth analysis** performed on the two final designs **based on a shortened project life of only 9 years**. Compare the alternatives at the MARR of 10% per year. (all dollar values are in thousands)

	Packaging Machine Design A	Packaging Machine Design B
First Cost, $	-900	-1,500
AOC, $ per year	-200	-300
Salvage value, $ (after 7 years of use)		200
Salvage value, $ (after 3 years of use)	100	
Salvage value, $ (after 2 years of use)	20	50
Annual revenue, $ per year	800	900
Life, years	3	7
AW ($K per year) for one full life cycle	268.312	312.967
AW for a particle life of 2 years ($K per year)	90.953	-240.476

Assuming that the AW values for Designs A and B provided in the table are correct, which of the

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Question 4

0 / 5 pts

You have been asked to determine the most financially advantageous option for a new Product Packaging machine. It has been determined by the Marketing Department that product packaging actually makes a difference in the anticipated Yearly Revenue generated by this product and have been provided below. The director now wants an **annual worth analysis** performed on the two final designs **based on a shortened project life of only 9 years**. Compare the alternatives at the MARR of 10% per year. (all dollar values are in thousands)

	Packaging Machine Design A	Packaging Machine Design B
First Cost, $	-900	-1,500
AOC, $ per year	-200	-300
Salvage value, $ (after 7 years of use)		200
Salvage value, $ (after 3 years of use)	100	
Salvage value, $ (after 2 years of use)	20	50
Annual revenue, $ per year	800	900
Life, years	3	7
AW ($K per year) for one full life cycle	268.312	312.967

How are you going to fulfill the nine (9) year Period of Need for Design A and Design B respectively in order to correctly determine the most financially advantageous Packaging

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Question 9

10 / 10 pts

Determine the Rate of Return (ROR) for the following project.

Initial Capital Investment (P) = $2,942,825
Project Life (n) = 10 years
Salvage Value at the end of year 10 = $50,000
Equal Annual Revenues = $1,100,000
Equal Annual Operations and Maintenance Costs (AOC) = $400,000
Minimum Acceptable Rate of Return (MARR) = 22% ycy

That is the ROR of the project (to the nearest 1%)?

18%

Compound Interest Factors 18%

n	Single Payment: Compound Amount Factor Find F Given P F/P	Single Payment: Present Worth Factor Find P Given F P/F	Uniform Payment Series: Sinking Fund Factor Find A Given F A/F	Uniform Payment Series: Capital Recovery Factor Find A Given P A/P	Uniform Payment Series: Compound Amount Factor Find F Given A F/A	Uniform Payment Series: Present Worth Factor Find P Given A P/A	Arithmetic Gradient: Gradient Uniform Series Find A Given G A/G	Arithmetic Gradient: Gradient Present Worth Find P Given G P/G	n
1	1.180	.8475	1.0000	1.1800	1.000	0.847	0	0	1
2	1.392	.7182	.4587	.6387	2.180	1.566	0.459	0.718	2
3	1.643	.6086	.2799	.4599	3.572	2.174	0.890	1.935	3
4	1.939	.5158	.1917	.3717	5.215	2.690	1.295	3.483	4
5	2.288	.4371	.1398	.3198	7.154	3.127	1.673	5.231	5
6	2.700	.3704	.1059	.2859	9.442	3.498	2.025	7.083	6
7	3.185	.3139	.0824	.2624	12.142	3.812	2.353	8.967	7
8	3.759	.2660	.0652	.2452	15.327	4.078	2.656	10.829	8
9	4.435	.2255	.0524	.2324	19.086	4.303	2.936	12.633	9
10	5.234	.1911	.0425	.2225	23.521	4.494	3.194	14.352	10
11	6.176	.1619	.0348	.2148	28.755	4.656	3.430	15.972	11
12	7.288	.1372	.0286	.2086	34.931	4.793	3.647	17.481	12
13	8.599	.1163	.0237	.2037	42.219	4.910	3.845	18.877	13
14	10.147	.0985	.0197	.1997	50.818	5.008	4.025	20.158	14
15	11.974	.0835	.0164	.1964	60.965	5.092	4.189	21.327	15
16	14.129	.0708	.0137	.1937	72.939	5.162	4.337	22.389	16
17	16.672	.0600	.0115	.1915	87.068	5.222	4.471	23.348	17
18	19.673	.0508	.00964	.1896	103.740	5.273	4.592	24.212	18
19	23.214	.0431	.00810	.1881	123.413	5.316	4.700	24.988	19
20	27.393	.0365	.00682	.1868	146.628	5.353	4.798	25.681	20
21	32.324	.0309	.00575	.1857	174.021	5.384	4.885	26.300	21
22	38.142	.0262	.00485	.1848	206.345	5.410	4.963	26.851	22

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Question 13

5 / 5 pts

Federal Grass Lands located near a growing population area is being considered for use as an Industrial Development Region. This section of Federal Grass Lands currently generates $200,000 in grazing use fees each year. Grazing will not be permitted on this property once it is re-zoned as an Industrial Development Region. The new industry attracted to this region will increase the commercial development by $1,500,000 per year for the next 10 years. The capital expenditure required to convert the grass land into the Industrial Development Region is $5,000,000. The annual Maintenance & Operations Costs for this project are $400,000 per year. Assuming that this project has a life of 10 years. The discount factor used to evaluate this project is 10%.

Note: This is a Multiple Answer question. Please select all of the following options you think are correct?

The disbenefits of this project are:

- [x] The $200,000 per year in grazing fees
- [ ] The $400,000 annual M&O Costs
- [ ] The $1,500,000 per year in commercial development
- [ ] The $5,000,000 capital investment

Help Center

Question 1

7.5 / 1

Which of the following statements are correct in the context of Annual Worth Value Calculations?

Note: This is a Multiple Answers question so please select all of the options you believe are correct.

- [ ] If the period of need is greater or equal to the Least Common Multiple (LCM) of the lives of all of the alternatives, then we simply need to compare the Annual Worth (AW) of each alternative over one life cycle to determine the best project.
- [x] The decision criteria used to evaluate a single project using the AW method is to accept a project if its AW value, (calculated with a discount rate (i) equal to MARR), is greater than Zero.
- [ ] You must use an incremental project justification approach when comparing two or more Mutually Exclusive Projects when using Annual Worth (AW) project values.
- [x] The output of an Annual Worth Value Calculation is easy to understand and communicate because it is stated in terms of dollars per year.

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Question 14

10 / 10 pts

Federal Grass Lands located near a growing population area is being considered for use as an Industrial Development Region. This section of Federal Grass Lands currently generates $200,000 in grazing use fees each year. Grazing will not be permitted on this property once it is re-zoned as an Industrial Development Region. The new industry attracted to this region will increase the commercial development by $1,500,000 per year for the next 10 years. The capital expenditure required to convert the grass land into the Industrial Development Region is $5,000,000. The annual Maintenance & Operations Costs for this project are $400,000 per year. Assuming that this project has a life of 10 years. The discount factor used to evaluate this project is 10%.

Modified B / C = (benefits – disbenefits – M&O costs) / initial investment

Calculate the Modified Benefit / Cost Ratio based on Annual Worth (AW) for the above project and determine if the project is justified.

10%

Compound Interest Factors

10%

n	Single Payment: Compound Amount Factor Find F Given P F/P	Single Payment: Present Worth Factor Find P Given F P/F	Uniform Payment Series: Sinking Fund Factor Find A Given F A/F	Uniform Payment Series: Capital Recovery Factor Find A Given P A/P	Uniform Payment Series: Compound Amount Factor Find F Given A F/A	Uniform Payment Series: Present Worth Factor Find P Given A P/A	Arithmetic Gradient: Gradient Uniform Series Find A Given G A/G	Arithmetic Gradient: Gradient Present Worth Find P Given G P/G	n
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

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Question 12

2.5 / 5 pts

Which of the following project characteristics are associated with Public Sector Projects?

Note: This is a Multiple Answer question. Please select all of the following options you think are correct?

- [x] The discount rate used to justify Public Sector Projects is typically higher than those found in Private Sector Projects.
- [ ] Stocks, bonds, loans, and individual investments typically provide the funding for this class of project.
- [ ] Multiple selection criteria are frequently used in this type of project.
- [x] The estimated life of public sector projects are Longer (30 to 50+ years)
- [x] The size of the investments are Large
- [x] Profit is not considered in purely Public Sector Projects.

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Question 11

1.67 / 5 pts

Which of the five project net cashflows presented in the table below would be considered a Conventional cashflow?

Note: This is a Multiple Answer question. Please select all of the following options you think are correct?

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Project 1	-50,000	30,000	15,000	5,000	3,000	7,000	13,000
Project 2	-50,000	-10,000	50,000	70,000	3,000	-2,000	-5,000
Project 3	-100,000	-20,000	50,000	80,000	120,000	0	0
Project 4	-70,000	-30,000	20,000	70,000	-10,000	5,000	20,000
Project 5	-80,000	-40,000	-35,000	23,000	47,000	43,000	19,000

- [ ] Project 4
- [x] Project 1
- [ ] Project 5
- [ ] Project 3
- [ ] Project 2

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34	25.548	.0391	.00407	.1041	245.477	9.609	8.615	82.777	34
35	28.102	.0356	.00369	.1037	271.025	9.644	8.709	83.987	35
40	45.259	.0221	.00226	.1023	442.593	9.779	9.096	88.953	40
45	72.891	.0137	.00139	.1014	718.905	9.863	9.374	92.454	45
50	117.391	.00852	.00086	.1009	1 163.9	9.915	9.570	94.889	50
55	189.059	.00529	.00053	.1005	1 880.6	9.947	9.708	96.562	55
60	304.482	.00328	.00033	.1003	3 034.8	9.967	9.802	97.701	60
65	490.371	.00204	.00020	.1002	4 893.7	9.980	9.867	98.471	65
70	789.748	.00127	.00013	.1001	7 887.5	9.987	9.911	98.987	70
75	1271.9	.00079	.00008	.1001	12 709.0	9.992	9.941	99.332	75
80	2048.4	.00049	.00005	.1000	20 474.0	9.995	9.961	99.561	80
85	3299.0	.00030	.00003	.1000	32 979.7	9.997	9.974	99.712	85
90	5313.0	.00019	.00002	.1000	53 120.3	9.998	9.983	99.812	90
95	8556.7	.00012	.00001	.1000	85 556.9	9.999	9.989	99.877	95
100	13780.6	.00007	.00001	1000	137 796.3	9.999	9.993	99.920	100

Modified B / C Ratio = 1.257, The project is justified

Not enough information is provided to determine the Modified B / C Ratio or if the project is justified.

Modified B / C Ratio = 0.180, The project is not justified

Modified B / C Ratio = 1.106, The project is justified

Modified B / C Ratio = 0.904, The project is not justified

Quiz Score: **63.67** out of 100

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Assuming that the AW values for Designs A and B provided in the table are correct, which of the following equations presented below will generate the correct AW value for Design B with a nine (9) year period of need?

- [312.967)(P/A 10,7) + (-240.476)(P/A 10,2)(F/P 10,7)](A/P 10,9)
- [(312.967)(P/A 10,7) + (-240.476)(P/A 10,2)](A/P 10,9)
- None of the equations presented will provide the correct value of AW for Design B over a 9 year Period of Need.
- [(312.967 * 7) + (-240.476 * 2)](A/P 10,9)
- [(312.967)(P/A 10,7) + (-240.476)(P/A 10,2)](F/P 10,7)
- [312.967)(P/A 10,7) + (-240.476)(P/A 10,2)(P/F 10,7)](A/P 10,9)

Question 6

5 / 5 pts

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Question 6

5 / 5 pts

The Rate of Return (ROR) for five different Mutually Exclusive project alternatives are provided in the table below.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
ROR (%)	17%	15%	21%	25%	19%

Which of the five Alternatives provides the greatest economic value?

- Alt. 1
- Alt. 4
- Not enough information is provided to determine the most financially advantageous Alternative.
- Alt. 3
- Alt. 2
- Alt. 5