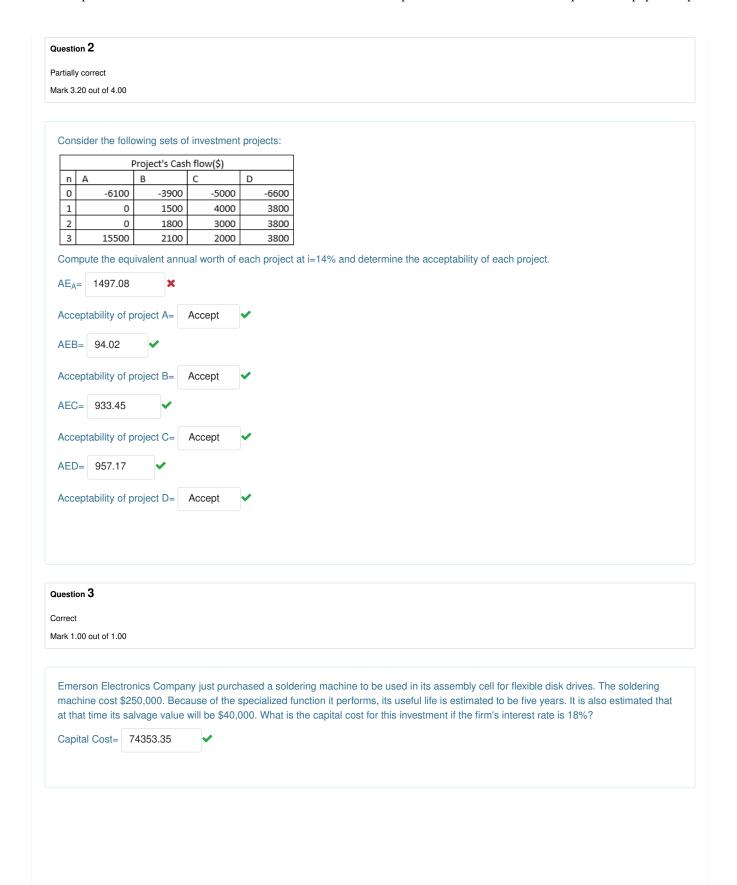
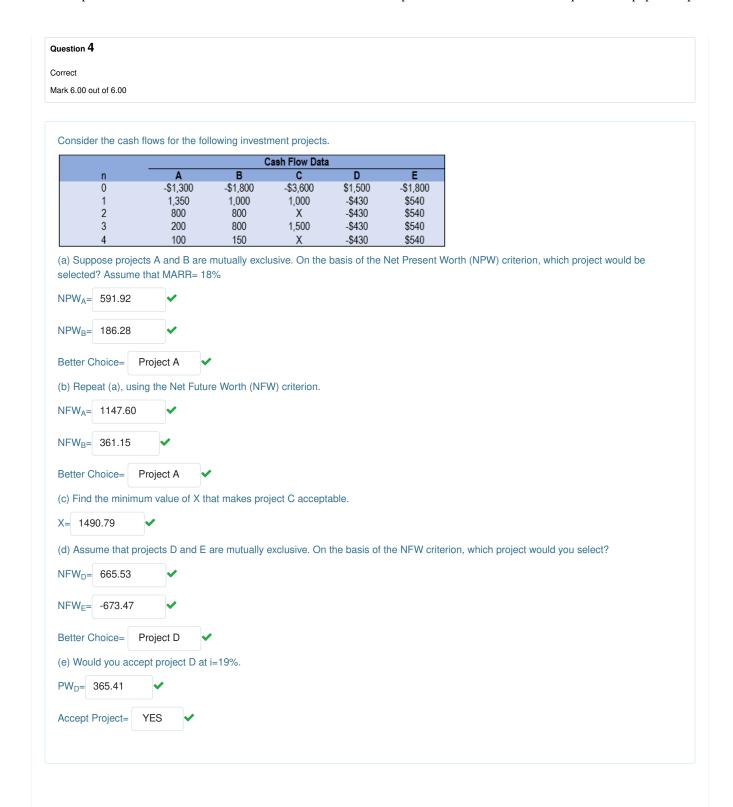
Dashboard / My courses / ENG M 401 (LEC B1 Winter 2021) / Assignments / Assignment #5

Started on	Thursday, 25 March 2021, 5:55 PM
State	Finished
Completed on	Thursday, 25 March 2021, 10:30 PM
Time taken	4 hours 34 mins
Marks	36.80/40.00
Grade	92.00 out of 100.00
Question 1	
Correct	
Mark 6.00 out of 6.00	d bridge costs \$4000000. The same bridge is estimated to need renovation every 15 years at a cost of \$870000. Annu
Mark 6.00 out of 6.00 A newly constructed repairs and main-ter	d bridge costs \$4000000. The same bridge is estimated to need renovation every 15 years at a cost of \$870000. Annunance are estimated to be \$99000 per year.
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A newly constructed repairs and main-ter	nance are estimated to be \$99000 per year. e is 6%, determine the capitalized cost of the bridge. 6272960.08
A newly constructed repairs and main-ter (a) If the interest rate (b) Suppose that, in 6044176.08	nance are estimated to be \$99000 per year. e is 6%, determine the capitalized cost of the bridge. (a), the bridge must be renovated every 20 years, not every 15 years. What is the capitalized cost of the bridge?
A newly constructed repairs and main-ter (a) If the interest rate (b) Suppose that, in 6044176.08	nance are estimated to be \$99000 per year. e is 6%, determine the capitalized cost of the bridge. 6272960.08 (a), the bridge must be renovated every 20 years, not every 15 years. What is the capitalized cost of the bridge? (b) with an interest rate of 10%. What have you to say about the effect of interest on the results? As interest rate





Question 5

Partially correct

Mark 0.60 out of 3.00

Consider the following two mutually exclusive investment projects:

	Cash Flow Data				
n	Project A	Project B			
0	-\$21,500	-\$26,300			
1	17,500	25,500			
2	17,000	18,000			
3	15,000				

On the basis of the Net Present Worth (NPW) criterion, which project would be selected if you use an infinite planning horizon with project repeatability (the same costs and benefits) likely? Assume that i=12%.



Better Choice= Project A

✓

Question 6

Correct

Mark 3.00 out of 3.00

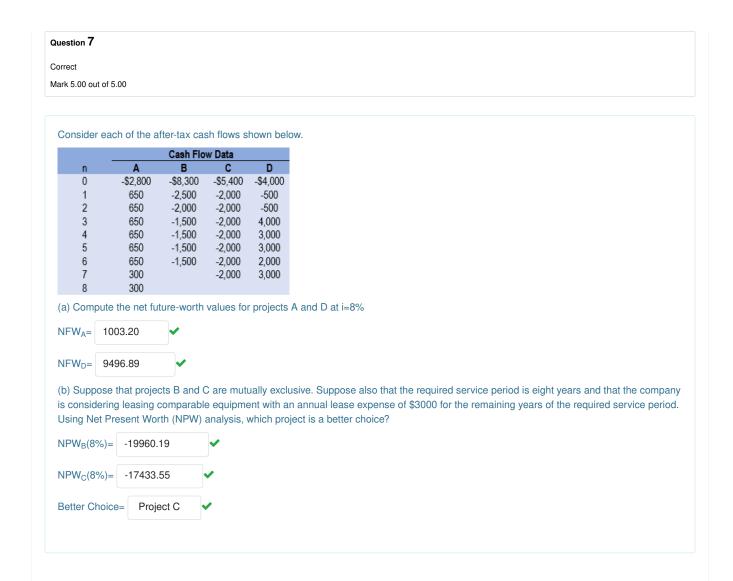
Consider the following two mutually exclusive projects:

	B1		B2	
n	Cash Flow	Salvage Value	Cash Flow	Salvage Value
0	-\$15,700		-\$14,800	
1	-2000	6000	-2100	6000
2	-2000	4000	-2100	3000
3	-2000	3000	-2100	1000
4	-2000	2000		
5	-2000	2000		

Salvage values represent the net proceeds (after tax) from disposal of the assets if they are sold at the end of each year. Both B1 and B2 will be available (or can be repeated) with the same costs and salvage values for an indefinite period.

Assuming a common service period of 15 years, which project is a better choice at MARR= 9%?





Question 8	
Correct	
Mark 1.00 out of 1.00	
6.18 A large refinery–petrochemical complex is to manufacture caustic	

- 6.18 A large refinery—petrochemical complex is to manufacture caustic soda, which will use feedwater of 40,000 litres per day. Two types of feedwater storage installation are being considered over the 40 years of their useful life.
 - Option 1. Build an 80,000-litre tank on a tower. The cost of installing the tank and tower is estimated to be \$164,000. The salvage value is estimated to be negligible.
 - Option 2. Place a tank of 80,000-litre capacity on a hill, which is 150 metres away from the refinery. The cost of installing the tank on the hill, including the extra length of service lines, is estimated to be \$120,000, with negligible salvage value. Because of the tank's location on the hill, an additional investment of \$12,000 in pumping equipment is required. The pumping equipment is expected to have a service life of 20 years, with a salvage value of \$1000 at the end of that time. The annual operating and maintenance cost (including any income tax effects) for the pumping operation is estimated at \$1000.

If the firm's MARR is known to be 12%, which option is better, on the basis of the present-worth criterion?

Better Choice= Option 2 ✓

Question 9				
Correct				
Mark 6.00 out of 6.00				
 6.21 Saskatchewan Environmental Consulting (SEC) Inc. designs plans and specifications for asbestos abatement (removal) projects in public, private, and governmental buildings. Currently, SEC must conduct an air test before allowing the reoccupancy of a building from which asbestos has been removed. SEC subcontracts air-test samples to a laboratory for analysis by transmission electron microscopy (TEM). To offset the cost of TEM analysis, SEC charges its clients \$100 more than the subcontractor's fee. The only expenses in this system are the costs of shipping the air-test samples to the subcontractor and the labour involved in shipping the samples. With the growth of the business, SEC is having to consider either continuing to subcontract the TEM analysis to outside companies or developing its own TEM laboratory. With recent government regulation requiring the removal of asbestos, SEC expects about 1000 air-sample testings per year over eight years. The firm's MARR is known to be 15%. Subcontract option. The client is charged \$400 per sample, which is \$100 above the subcontracting fee of \$300. Labour expenses are \$1500 per year, and shipping expenses are estimated to be \$0.50 per sample. TEM purchase option. The purchase and installation cost for the TEM is 				

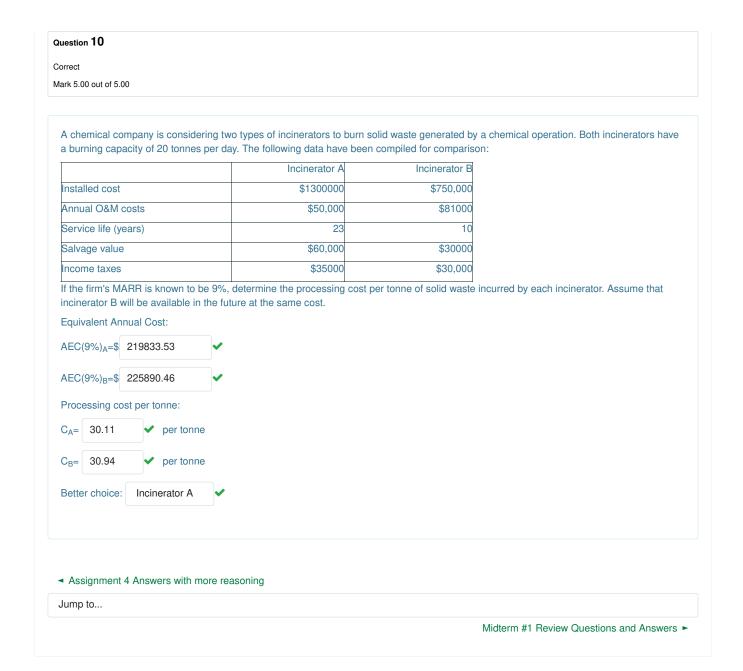
• TEM purchase option. The purchase and installation cost for the TEM is \$415,000. The equipment would last for eight years, at which time it should have no salvage value. The design and renovation cost is estimated to be \$9500. The client is charged \$300 per sample, based on the current market price. One full-time manager and two part-time technicians are needed to operate the laboratory. Their combined annual salaries will be \$50,000. Material required to operate the lab includes carbon rods, copper grids, filter equipment, and acctone. The costs of these materials are estimated at \$6000 per year. Utility costs, operating and maintenance costs, and the indirect labour needed to maintain the lab are estimated at \$18,000 per year. The extra income-tax expenses would be \$20,000.

(a) Calculate the followings:

Unit Cost for TEM Purchase Option: \$ 98.00
Unit Cost for TEM Purchase Option: \$ 188.60

(b) What is the required number of air samples per year to make the two options equivalent? (The answer should be an integer)

Number of Air samples: 934



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