IE2111 ISE Principles & Practice II
Assignment #3
Due: 20 Feb 2024, 5 pm

You may use Excel or any computing tools for your calculations, but you must explain or show relevant formulas or equations in your solutions. Submit your completed assignment anytime into the Drop Box outside the ISEM Department Office at E1A-06-25, or to the professor at the end of the lecture.

The immigration and checkpoints authority is considering the installation of remotely operated solar-powered surveillance systems in a coastal area that has been prone to illegal immigrants. Three alternative systems have been identified and relevant data are given below:

	Alternative A	**Alternative B**	**Alternative C**
Initial Cost	\$120,000	\$150,000	\$192,000
Useful Life	6 years	12 years	18 years
Annual O&M Cost	Year 1 to 6: \$12,000	Year 1 to 6: \$9,600 Year 7 to 12: \$14,400	Year 1 to 6: \$6,000 Year 7 to 12: \$12,000 Year 13 to 18: \$18,000
Market value at EoY 6	\$36,000	\$48,000	\$72,000
Market value at EoY 12	--	\$24,000	\$30,000
Market value at EoY 18	--	--	\$18,000

MARR for this project is 6%.

(*a*) If the study period is 6 years, determine which alternative system should be chosen using the ***PW*** method. State the main assumptions made. (5 marks)

(*b*) If the study period is 6 years, determine which alternative system should be chosen using the Incremental ***IRR*** analysis method. You may use any equation solver or software to compute *IRR*s after stating the relevant equations to be solved. (5 marks)

(*c*) If the study period is 12 years, determine which alternative should be chosen using any *Discounted Cash Flow* method. State the main assumptions made. (5 marks)

(*d*) If the study period is infinity, determine which alternative should be chosen. State the main assumptions made. (5 marks)