

## IE2111 ISE Principles & Practice II

### Assignment #3

Date Due: 18 February 2025, 5 pm

#### Instructions

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

(Total Marks: 20)

OneISE is a leading EV charger manufacturer with over 30 years of experience in the electrical industry. It has recently developed a quick charging technology and is considering investing in a new manufacturing plant that will integrate with its current supply chain to deliver the new product and related services to its customers. The company has 3 alternatives with relevant data given in the table below:

	Alternative A Invest Large	Alternative B Invest Medium	Alternative C Invest Small
Initial Investment Cost	\$1,800,000	\$1,200,000	\$600,000
Annual Revenue	\$450,000	\$370,000	\$300,000
Annual Operation Cost	\$30,000	\$20,000	\$15,000
Useful Life	9 years	6 years	3 years
Market value at EoY 3	\$900,000	\$450,000	\$60,000
Market value at EoY 6	\$450,000	\$120,000	-
Market value at EoY 9	\$180,000	-	-

The company's *MARR* is 10%.

- (a) If the study period is 3 years, determine which investment alternative should be chosen using any *Discounted Cash Flow* method (*PW*, *AW*, *FW*). State the main assumptions made. (5 marks)
- (b) If the study period is 6 years, determine which investment alternative should be chosen using any *Discounted Cash Flow* method (*PW*, *AW*, *FW*). State the main assumptions made. (5 marks)
- (c) If the study period is 6 years, determine which alternative system should be chosen using the *Internal Rate of Return* method. You may use any equation solver or software to compute *IRRs* after stating the relevant equations to be solved. (5 marks)
- (d) If the study period is infinity, determine which alternative should be chosen using any method. State the main assumptions made. (5 marks)