

**ME402 Assessment/Quiz: “Unit 4”
Answer Key**

1. There are two types of real options: (i) options ON projects and (ii) options IN projects.
2. The additive approach cannot express the value of any interaction between the different objects.
3. According to Design Decisions Wiki (http://wiki.ece.cmu.edu/ddl/index.php/Multiattribute_utility_theory#Building_the_Utility_Function), to determine the utility value, or the desirability, of the design, there are six steps to be followed:
 1. Identify significant design attributes and generate alternative designs.
 2. Verify relevant attribute conditions or bounds.
 3. Use the lottery to determine the designer’s preference.
 4. Evaluate the Single Attribute Utility (SAU) function and trade-off preferences.
 5. Combine SAUs into the Multi-Attribute Utility function (MAU).
 6. Select an alternative with the highest MAU value by ranking the alternatives.
4. See Design Decision Wiki—Lottery section (http://wiki.ece.cmu.edu/ddl/index.php/Multiattribute_utility_theory#Lottery).
5. The axioms of rational behavior are as follows:
 - Axiom 0: Preferences exist.
 - Axiom 1: Comparison of lotteries with identical consequences: Two simple lotteries, each with same prize and penalty: Choose lottery with higher probability of prize.
 - Axiom 2a: Quantification of preferences (“indifference probability” or “preference value”).
 - Axiom 2b: Quantification of uncertainty.
 - Axiom 3: Transitivity of preferences.
 - Axiom 4: Substitution of consequences.
 - Axiom 5: Equivalence of preferences for actual and conjectural situations.
6. A value function ranks the order relative preference between sets of consequences.