important when a significant change is considered in the design of the current best-selling product? (1.3, 1.4)

1-4. Will the increased use of automation increase the importance of engineering economy studies? Why or why not?

1-5. Explain the meaning of the statement "the choice (decision) is among alternatives." (1.3)

1-6. Describe the outcomes that should be expected from a feasible alternative. What are the differences between potential alternatives and feasible alternatives? (1.4)

1-7. Define uncertainty. What are some of the basic causes of uncertainty in engineering economy studies? (1.3)

1-1. List 10 typical situations in the operation of an organization where an engineering economic analysis would significantly assist decision making. You may assume a specific type of organization (e.g., manufacturing firm, medical health center and hospital, transportation company, government agency, etc.) if it will assist in the development of your answer (state any assumptions). (1.1)*

1-2. Explain why the subject of engineering economy is important to the practicing engineer. (1.1–1.4)

1-3. Assume that your employer is a manufacturing firm that produces several different electronic consumer products. What are five nonmonetary factors (attributes) that may be

1-8. You have discussed with a coworker in the engineering department the importance of explicitly defining the viewpoint (perspective) from which future outcomes of a course of action being analyzed are to be developed. Explain what you mean by a viewpoint or perspective. (1.3)

1-9. Describe three situations in which the monetary differences among engineering alternatives could be less important than the nonmonetary differences among them. (1.4)

1-10. Two years ago you were a member of the project team that analyzed whether your company should upgrade some building, equipment, and related facilities to support the expanding operation of the company. The project team analyzed three feasible alternatives, one of which makes no changes in facilities and the remaining two involve significant facility changes. Now you have been selected to lead a postevaluation team. Delineate your technical plan for comparing the estimated consequences (developed two years ago) of implementing the selected alternative with the results that have been achieved. (1.3, 1.4)

1-11. Describe how it might be feasible in an engineering economic analysis to consider the following different situations in terms of the monetary unit: (1.3)

a. A piece of equipment that is being considered as a replacement for an existing item has greater reliability; that is, the mean time between failures (MTBF) during operation of the new equipment has been increased 40% in comparison with the present item.

b. A company manufactures wrought iron patio furniture for the home market. Some changes in material and metal treatment, which involve increased manufacturing costs, are being considered to significantly reduce the problem of rusting.

c. A large foundry operation has been in the same location in a metropolitan area for the past 35 years. Even though it is in compliance with current air pollution regulations, the continuing residential and commercial development of that area is causing an increasing expectation on the part of local residents for improved environmental control by the foundry. The company considers community relations to be important.

1-12. Explain the relationship between engineering economic analysis and engineering design. How does economic analysis assist decision making in the design process? (1.4)

1-13. In your own words, describe the concept of the net cash flow for a project alternative. (1.4)

1-14. For each of the seven steps in the engineering economic analysis process, describe the activities that normally would be accomplished in that part of the analysis. (1.4)

1-15. Why does the use of accounting data in engineering economy studies need to be carefully watched? (1.5)

1-16. Comment on the statement "Sophisticated analysis seldom compensates for bad judgment."

1-17. *The Almost Graduating Senior Problem.* Consider this situation faced by a first semester senior in civil engineering who is exhausted from extensive job interviewing and penniless from excessive partying. Mary's impulse is to accept immediately a highly attractive job offer to work in her brother's successful manufacturing company. She would then be able to relax for a year or two, save some money, and then return to college to complete her senior year and graduate. Mary is cautious about this impulsive desire because it may lead to no college degree at all!

a. Develop at least two formulations for Mary's problem.

b. Identify feasible solutions for each problem formulation in part (a). *Be creative!*