1. [**5**×**5**] Discuss the difference(s) between the following pairs of concepts (use examples when necessary):
   (a) *CASE workbench* and *CASE environment*
   (b) *exploratory development* and *incremental development*
   (c) *releases* and *versions*
   (d) *software reverse engineering* and *software re-engineering*
   (e) *waterfall model* and *spiral model*
2. [**15**] What are the four most important attributes that a well-engineered software system should have? Why are they important in the development of high-quality software?
3. A software product will be used by school children to learn the multiplication tables for the natural numbers 1-10.
   (a) [**10**] Define a domain requirement for this software.
   (b) [**10**] Is this requirement a functional or non-functional requirement? Explain your answer.
4. [**15**] Explain why DFD (data-flow diagram) is good for functional analysis but not useful in object-oriented analysis.
5. [**25**] Construct a state transition diagram to illustrate the following rule:

   Students are required to work individually on assignments and examinations. As a general rule, anyone involved in cheating will be reported to the authority with mark reductions. When it happens in Assignment 1, a mark reduction of $1/2^n$ applies if the number (n) of copied solutions/answers is no more than two and the person(s) confesses before a given deadline. Otherwise, the involved person(s) will receive zero marks, and he/she will be reported to the School director. Any cheating after Assignment 1 will be considered a serious offense, which will lead to a complete loss of marks. Early confession will not change the marks but will be passed to the School director as a possible reason not to be reported to the University. If, however, cheating takes place during examinations, the involved person(s) will be immediately reported to the University for official processing.