Assume the following partially specified system:

A system manages information about patients in a hospital. There are two types of users: medical personnel and patients. The system must allow both types of users to update patient information, it must have persistent storage (information is retrieved from session to session), new users must be inserted in the system, each patient has a unique ID, first name and last name, the status of a patient must be either “in-patient” (it is checked in the hospital) or “out-patient” (not checked in the hospital). Each patient in the system has attached a treatment that can be updated at any time by the medical personnel.

Make any assumptions that you believe are needed to complete the questions below. Explain your answers.

Question 1

Write two functional requirements regarding a desired listing functionality that would be included in the category “functional suitability” of the standard ISO/IEC 25010:2011.

Question 2

Write two non-functional requirements related to the performance of the tool that would be included in the category “performance efficiency” of the standard ISO/IEC 25010:2011.

Question 3

Write two specific test cases you would use to test the system.

Question 4

The functionality for entering patient data is to be tested using a FSM. Entering a field prompts a transition in this FSM. The data required is the patient unique ID, the first name and the last name. The last two can be entered *in any order but only after the unique ID has been entered*. Create the derived FSM and specify the transitions as a transition matrix.

Question E

With respect to the previous FSM, the probability of entering the first name first is twice that of entering the last name. Derive the Markov Chain from the previous FSM.

Question 1

Explain the difference between quality planning, assurance and control.

Question 2

Explain, from the point of view of software quality, what is the *appraisal cost* and give two examples.

Question 3

Describe each of the stages of the People Capability Maturity Model: Initial, Repeatable, Defined, Managed and Optimized.

Question 4

Describe the type of errors that are detected when “static control flow analysis” is performed in the code.

Question 5

Consider a function inside a navigational system for a car that receives the current speed as parameter and returns a estimation the gas consumption of the vehicle. It applies different estimations for the following speed ranges (in Km/h): 10-30, 30-50, 50-80, 80-120. What values would you choose to write black-box tests for such function based on the technique of input equivalence partition?

Question 6

Calculate the cyclomatic complexity of the following method:

```
void traverse_objects(Item set[]) {
      int i,j,acc;
      acc = 0
      for (i = 0; i < set.length; i++) {
            Item it = set[i];
            if (it.field1 != 0) {
                  acc += it.field1;
            }
            if (it.double == 1) {
                  acc += it.field1;
            }
      }
}
```

Question 7

What kind of functionality is provided by a test management tool in the area of reporting?