

National Exams December 2014

04-Soft-A6, Software Quality Assurance

3 hours duration

NOTES:

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is an OPEN BOOK EXAM. Candidates may use any non-communicating calculator.
3. FIVE (5) questions constitute a complete exam paper. The first five questions as they appear in the answer book will be marked.
4. Each question is of equal value.
5. Most questions require short written answers. Clarity and organization of the answer are important, but full sentences are NOT required. Be sure to bullet lists and ideas wherever possible.

1.
 - a) What is software quality assurance? What is software quality control? What is the difference between them?
 - b) Describe briefly the structure of quality cost, e.g. what can be included in prevention cost, appraisal cost, and failure cost.
 - c) List 4-5 software quality measures.

2.
 - a) What are objectives of the Formal Technical Review (FTR)?
 - b) What is agile software development?
 - c) Compare and contrast the FTR activity in two cases: (1) if you use the Waterfall model and (2) agile development.

3.
 - a) Compare and contrast the top-down and bottom-up integration testing for relatively small and relatively large software projects.
 - b) What is the purpose of regression testing? How the regression testing is conducted?

- 4.)
 - a) Describe white-box and black-box unit testing techniques you know.
 - b) Compare and contrast the techniques mentioned in the answer (4.a).

5. Assume you test a simple database in Appendix A. Using the “insert” statements create a black-box test for the table “authorISBN”.

6. Assume you test a simple unit in Appendix B. Create a test for this unit using the basis path testing approach. Show all your work!!!

7.
 - a) What is the difference between software verification and validation? What are alpha, beta, and pilot tests?
 - b) List the types of system testing. Briefly describe the purpose of each type.

8. What is the relation between the software quality assurance and configuration management in the concurrent software development and agile software development?

Appendix A

```
drop database Books1;
create database Books1;
use Books1
create table publishers (
    publisherID int NOT NULL,
    publisherName varchar (30) NOT NULL,
    constraint pk_publishers primary key (publisherID)
);
create table authors (
    authorID int NOT NULL,
    firstName varchar (20) NOT NULL,
    lastName varchar (30) NOT NULL,
    constraint pk_authors primary key (authorID)
);
create table titles (
    isbn varchar (20) NOT NULL,
    title varchar (100) NOT NULL,
    editionNumber int NOT NULL,
    copyright varchar (4) NOT NULL,
    publisherID int NOT NULL,
    imageFile varchar (20) NOT NULL,
    price real NOT NULL,
    constraint fk_titles foreign key (publisherID)
        references publishers (publisherID),
    constraint pk_titles primary key (isbn)
);
create table authorISBN (
    authorID int NOT NULL,
    isbn varchar (20) NOT NULL,
    constraint fk_authorISBN_1 foreign key (authorID)
        references authors (authorID),
    constraint fk_authorISBN_2 foreign key (isbn)
        references titles (isbn)
);
```

Appendix B

```
Function fn_delete_element (int value, int array_size, int array[])
{
    int i;
    location = array_size + 1;

    for i = 1 to array_size
        if ( array[i] == value )
            location = i;
        end if;
    end for;

    for i = location to array_size
        array[i] = array[i+1];
    end for;
    array_size --;
}
```

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Marking Scheme

1. a) 3 marks
b) 5 marks
c) 2 marks
2. a) 5 marks
b) 2 marks
c) 3 marks
3. a) 5 marks
b) 5 marks
4. a) 5 marks
b) 5 marks
5. 10 marks
6. 10 marks
7. a) 5 marks
b) 5 marks
8. 10 marks