BITS PILANI, DUBAI CAMPUS

FIRST SEMESTER 2011- 2012

Comprehensive Examination

Course Code: BITS C461 **IV.YEAR** Date: 07.01.2012

Course Title: Software Engineering Max Marks: 40

Duration: 3 hours Weightage: 40 %

Note: Answer all the questions.

1. a. Draw and explain the failure curve for software. 2M

   b. State Mandel's golden rules. 2M

2. Explain with diagram, incremental process model. 4M

3. Draw an use case diagram for an **Online Public Access Catalog (OPAC)**, which is e-Library website and is part of **Integrated Library System** (ILS), also known as a **Library Management System** (LMS), that is managed by a library or group of libraries. Patrons of the library can search library catalog online to locate various resources - books, periodicals, audio and visual materials, or other items under control of the library. Patrons may reserve or renew item, provide feedback, and manage their account. 4M

4. Draw UML Activity Diagram for the scenario given below: 4M

   Three actors involved in the example-the student, the tutor and the examiner. The student has to carry out a sequence of three activities (or activity structures), each being conditional for the next.

   1. Preparation. Student receives all kinds of (optional) background information, like cases and hints information about the course, and chooses whether he/she wants to study the course with/without examples (personalization).

   2. Practice and tests. All four activities (a practice and test activity for each competency) should be reported to the tutor, but may be carried out in the order the student prefers. After sending in a practice activity report, the student receives feedback. After sending in a test activity report, the student receives an assessment.

   3. Grading. After the student has been assessed on the two test activities, he/she may request the examiner for a grade.

   The student is allowed repeated practice, but may take the tests only once. The tutor assesses the test reports according to certain criteria, and sends the two test grades to the examiner, who then gives a final grade to the student.

5. Draw a deployment diagram for Multi layered load balancing with hardware and software load balancing and clusters. A network load balancer is an appliance device that is used to split network load across multiple servers. It combines the functions of OSI Layer 7 (Application Layer) load balancing, HTTP compression, SSL offload and content caching in one solution. 4M

6. With the help of diagram explain Main program / sub program architecture. 4M

7. a. A store wishes to program a decision on non-cash receipts for goods into their intelligent bills.

The conditions to check are agreed as:

1. Transaction under £50
2. Pays by cheque with cheque card (guarantee £50)
3. Pays by credit card

The possible actions that a cashier could take are agreed as:

1. Ring up sale
2. Check credit card from local database
3. Call a supervisor
4. Automatic check of credit card company database

Using the rules above construct a decision table showing all possible combinations of alternatives.

The condition rules are yes or no (Y / N). 2M

b. What are the four broad activities that help a software team achieve high software quality? 2M

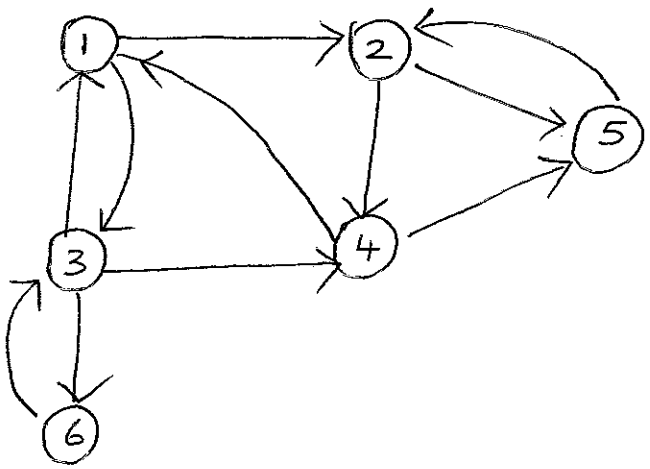
8. Draw the flow graph for the procedure given below and Compute Cyclomatic complexity. Find the various independent paths. 4M

```
c=0;
input(a);
input(b);
        while(a>0)
        {
                if (a>10)
                        a = a-b;
                else
                        b = b+1;
                print a,b;
        }
```

9. Describe unit-test environment with the help of diagram. 4M

10. a. Draw Gantt chart to recruit employees in an organization. 2M

b. For the given network find the arc to node ratio. 2M



BITS PILANI, DUBAI CAMPUS
FIRST SEMESTER 2011- 2012

Course Code: BITS C461 IV.**YEAR** Date: 04.12.2011
Course Title: Software Engineering Max Marks: 20
Duration: 50 minutes Weightage: 20 %

Test-II (Open Book)

Note: Only prescribed text book and class notes are allowed.

1. Draw activity diagram for Courseware Management System use case given below: 5M

   The course administrator is responsible for managing course information in the Courseware Management System. As part of managing the course information, the course administrator carries out the following activities:

   - Check if course exists
   - If course is new, proceed to the "Create Course" step
   - If course exists, check what operation is desired—whether to modify the course or remove the course
   - If the modify course operation is selected by the course administrator, the "Modify Course" activity is performed
   - If the remove course operation is selected by the course administrator, the "Remove Course" activity is performed

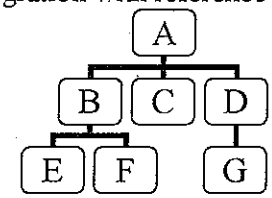
2. Draw swim lane diagram for Retail sales process for the use case given below: 4M

   A customer starts the process by choosing a product and makes payment either by credit or debit card. The different classes associated in this example are Customer, Sales Assistant, Bank and Credit card authority.

3. Find V(G) for the given graph matrix. 2M

	A	B	C	D
A			1	1
B				
C		1		
D		1		

4. Explain the steps for bottom up integration with reference to the following figure. 2M



5. Draw a decision table for the given scenario: Company X sells merchandise to wholesale and retail outlets. Wholesale customers receive a two percent discount on all orders. The company also encourages both wholesale and retail customers to pay cash on delivery by offering a two percent discount for this method of payment. Another two percent discount is given on orders of 50 or more units. Each column represents a certain type of order. 3M

6. Draw the deployment diagram for University Information System. 4M
   (Specify your assumptions clearly in your answer.)

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FIRST SEMESTER 2011- 2012

Course Code: BITS C461 IV.**YEAR** Date: 09.10.2011
Course Title: Software Engineering Max Marks: 25
Duration: 50 minutes Weightage: 25 %

1. Explain Hardware Failure Rate curve with the help of a diagram. 2M
2. Illustrate user interface design process. 2M
3. Explain modularity with diagram. 3M
4. With the help of diagram explain Spiral Model. 4M
5. Draw a UML Class Diagram representing the following elements from the problem domain for digital music players: An artist is either a band or a musician, where a band consists of two or more musicians. Each song has an artist who wrote it, and an artist who performed it, and a title. Assume a "song" means a *recording* of a piece of music, so that if a piece of music is recorded more than once (say, by different artists), we treat them as different songs. Therefore, each song is performed by exactly one artist, and written by exactly one artist. An album is composed of a number of tracks, each of which contains exactly one song. A song can be used in any number of tracks, because it could appear on more than one album (or even more than once on the same album!). A track has a bitrate and a duration. Because the order of the tracks on an album is important, the system will need to know, for any given track, what the next track is, and what the previous track is (if there is one). Draw a class diagram for this information, and be sure to label all the associations with appropriate multiplicities. 8M
6. Draw a use case diagram for the following example: Students are enrolling in courses with the potential help of registrars. Professors input the marks students earn on assignments and registrars authorize the distribution of transcripts (report cards) to students. The association between *Student* and *Enroll in Seminar* use case is initially invoked by a student and not by a registrar . Information is flowing back and forth between the actor and the use case, for example, students would need to indicate which seminars they want to enroll in and the system would need to indicate to the students whether they have been enrolled. A registrar may notice a student needs help and offers assistance, whereas other times, the student may request help from the registrar, important information that would be documented in the description of the use case. Actors are always involved with at least one use case and are always drawn on the outside edges of a use case diagram. 6M

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FIRST SEMESTER 2011- 2012

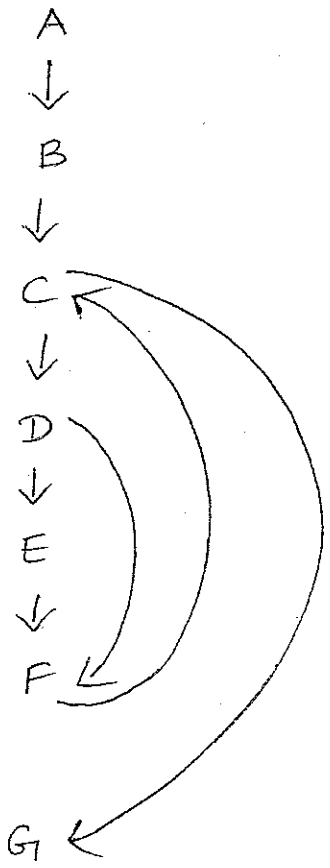
Course Code: BITS C461 IV.YEAR Date: 21.11.2011
Course Title: Software Engineering Max Marks: 7
Duration: 20 minutes Weightage: 7%

Quiz - 2

Version - A

Name: ..... ID No: ..... Sec / Prog: .....

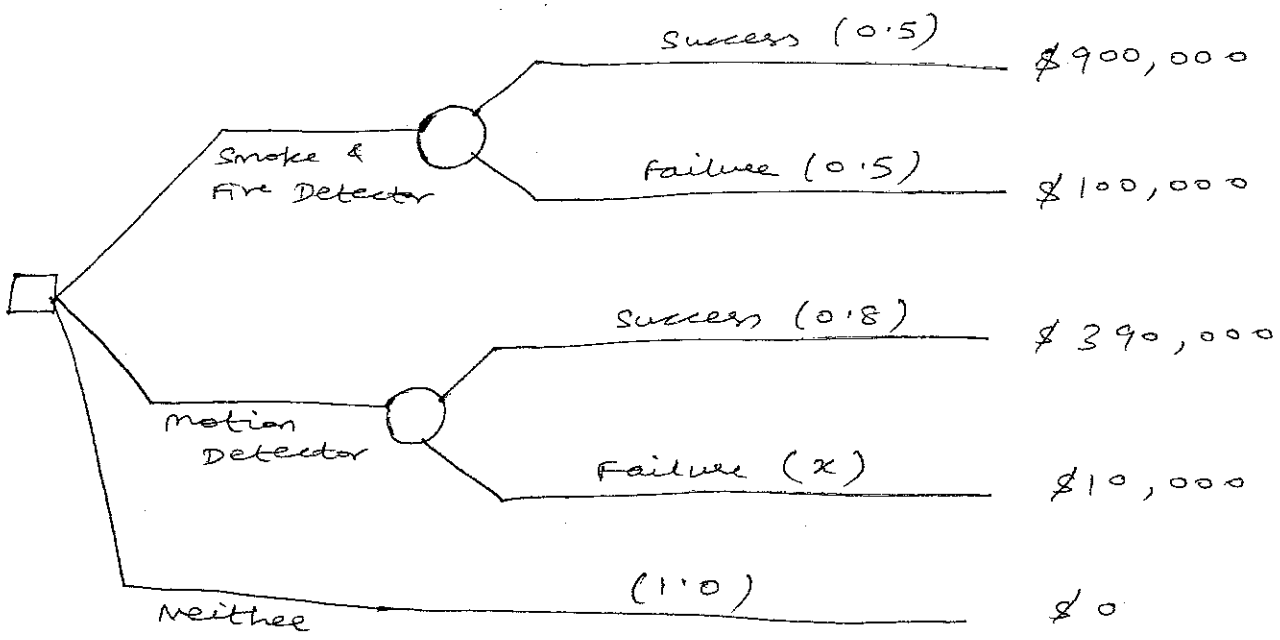
1. Draw a Graph Matrix corresponding to the flow graph and compute the Cyclomatic Complexity. Identify the predicate nodes. 3M



2. CBSE stands for _____ 0.5M

3. _____ method selects test paths of a program according to the locations of definitions and uses of variables in the program. 0.5M

4. For the given software based system, calculate the expected cost for Smoke & Fire detector, Motion detector and Neither of the decision tree. 3M



BITS PILANI, DUBAI CAMPUS

FIRST SEMESTER 2011- 2012

Course Code: BITS C461 | IV.YEAR | Date: 24.10.2011
Course Title: Software Engineering | Quiz - 1 (CB) | Max Marks: 8
Duration: 20 minutes | Weightage: 8%

Version - B

Name: ..... ID No: ..... Sec / Prog: .....

1. Mention two project scheduling methods that can be applied to software development. 1M

2. In _____ architecture, the components of a main program or subprogram architecture are distributed across multiple computers on a network. 1M

3. Mention any four McCall's software quality factors. 2M

4. Draw the class for the program given below. 2M

```
class Circle
{
 public:
   void SetRadius(double);
   double Area() ;
   double Circumference() ;
 private:
   double itsRadius;
};
```

5. Suppose the following rules are used to renew auto insurance policies:

   0 claims, age ≤ 25: raise by $50

   0 claims, age > 25: raise by $25

   1 claim, age ≤ 25: raise by $100, send letter

   1 claim, age > 25: raise by $50

   2, 3 or 4 claims, age ≤ 25: raise by $400, send letter

   2, 3 or 4 claims, age > 25: raise by $200, send letter

   more than 5 claims: cancel policy

   List the conditions and actions of the Decision table. 2M