

BITS PILANI, DUBAI CAMPUS
SECOND SEMESTER 2010- 2011
Comprehensive Examination

Course Code: BITS C461
Course Title: Software Engineering
Duration: 3 hours

IV. YEAR

Date: 30.05.2011
Max Marks: 40
Weightage: 40 %

Note: Answer all the questions.

1. Draw and explain the failure curves for hardware and software. 2M
2. Explain with diagram the prototyping paradigm. 3M
3. Consider the world of libraries. A library has books, videos and CDs that it loans to its users. All library material has a id# and a title. In addition, books have one or more authors, videos have one producer and one or more actors, while CD's have one or more entertainers. The library maintains one or more copies of each library item (book, video or CD).
Copies of all library material can be loaned to users. Reference-only material is loaned for 2 hours and can't be removed from the library. Other material can be loaned for 2 weeks. For every loan, the library records the user, the loan date and time, and the return data and time. For users, the library maintains their name, address and phone number.
Draw a class diagram for the description above. Make sure to show attributes, multiplicities and aggregations / compositions, where appropriate. No need to show any operations. 8M
4. Draw the Deployment diagram for Order Management System where the application is assumed to be a web based application which is deployed in a clustered environment using server 1, server 2 and server 3. The user is connecting to the application using internet. The control is flowing from the caching server to the clustered environment. 4M
5. With the help of diagram explain data-centered architecture. 2M
6. Draw the decision table for public utility billing system given below:

If the customer account is billed using a fixed rate method, a minimum monthly charge is assessed for consumption of less than 100 KWH (kilowatt-hours). Otherwise, computer billing applies a Schedule A rate structure. However, if the account is billed using a variable rate method, a Schedule A rate structure will apply to consumption below 100 KWH, with additional consumption billed according to Schedule B. 4M
7. State Mandel's golden rules. 1M
8. Draw the diagram for McCall's Software Quality factors. 1M
9. Draw Gantt chart for staff planning in an university during annual vacation for a period of 2 months. 3M

10. Explain the different categories of software engineering resources with the help of diagram. 3M
11. Explain Configuration Audit. 2M
12. Compute Software Maturity index if the number of modules in the current release is 12, and modules that have been changed are 1, and added are 3 and modules that were deleted is 2. 2M
13. Explain with diagram the steps for top-down integration. 3M
14. What is a Graph Matrix? 2M

BITS PILANI, DUBAI CAMPUS
SECOND SEMESTER 2010- 2011

Course Code: BITS C461
Course Title: Software Engineering
Duration: 50 minutes

IV.YEAR

Date: 15.05.2011
Max Marks: 20
Weightage: 20 %

Note: Open Book, Only Prescribed text book and class notes are allowed.

1. Draw Gantt chart for a simple compiler project for a period of six months with the following tasks like Design, Build Scanner, Build Parser, Build Code Generator, Write Manual and Integration / Testing. 4M
2. Which testing method is used to check the software in abnormal condition. Explain any one method in detail. 4M
3. What are the distinguishing characteristics of a software product? 2M
4. Suppose it is required to build a Web Development system consisting of 25,000 lines of code. How many person months of effort would this take using just this equation if the project size was relatively small. (Assume the linear Productivity factor for Web Development is 3.30 and Penalty factor is 1.030) 3M
5. Using the code as a foundation, draw a corresponding flow graph and determine the cyclomatic complexity of the resultant flow graph 7M

Example code: ReturnAverage()

```
public static double ReturnAverage(int value[], int AS, int MIN, int MAX)
```

```
{  
    /* Function: ReturnAverage Computes the average of all those numbers in the input array  
    in the positive range [MIN, MAX]. The maximum size of the array is AS. But, the array  
    size could be smaller than AS in which case the end of input is represented by -999. */
```

```
    int i, ti, tv, sum;  
    double av;  
    i = 0; ti = 0; tv = 0; sum = 0;  
    while (ti < AS && value[i] != -999) {  
        ti++;  
        if (value[i] >= MIN && value[i] <= MAX) {  
            tv++;  
            sum = sum + value[i];  
        }  
        i++;  
    }  
    if (tv > 0)  
        av = (double)sum/tv;  
    else  
        av = (double) -999;  
    return (av);  
}
```

BITS PILANI, DUBAI CAMPUS
SECOND SEMESTER 2010- 2011

Course Code: BITS C461
Course Title: Software Engineering
Duration: 50 minutes

IV. YEAR

Date: 27.03.2011
Max Marks: 25
Weightage: 25 %

1. Software doesn't wear out. Justify with the help of a diagram. 3M
2. Draw the user interface design process. 2M
3. What are coupling and cohesion, and why are they important in software design? Suggest measurable properties of a software design that can be used as indicators of the amount of coupling and cohesion. 3M
4. Name two alternatives to the waterfall model. What are the advantages and disadvantages of each model when used to plan a software development project. 4M
5. Suppose an instructor follows the following rules in assigning final marks to each student taking her course: If a calculated final mark is below 50, then the instructor reviews all the marks for the student and assigns a mark based on the review; otherwise, if a calculated final mark "fm" ends in -9, the instructor assigns the mark $fm+1$; otherwise the instructor assigns the calculated mark as is.
Draw a decision table that captures all the rules of this decision process. Make sure your table is complete, i.e., covers all conditions and outcomes. 4M
6. Draw a UML Class Diagram representing the following elements from the problem domain for a hockey league. A hockey league is made up of atleast four hockey teams. Each hockey team is composed of six to twelve players, and one player captains the team. A team has a name and a record. Players have a number and a position. Hockey teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and a number of years of experience, and can coach multiple teams. Coaches and players are people, and people have names and addresses. Draw a class diagram for this information, and be sure to label all associations with appropriate multiplicities. 6M
7. Draw a use case diagram for courses. In particular, assume that courses are taught by instructors, while registrars can enroll or remove students from a course. Students take a course, provided they are enrolled in it. 3M

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Course Code: BITS C461
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 Duration: 20 minutes

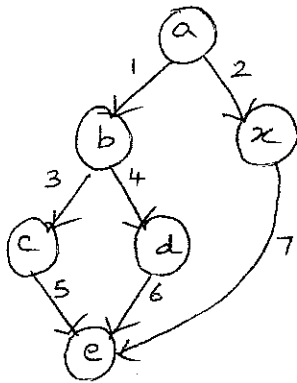
IV.YEAR

Date: 18.04.2011
 Max Marks: 7
 Weightage: 7%

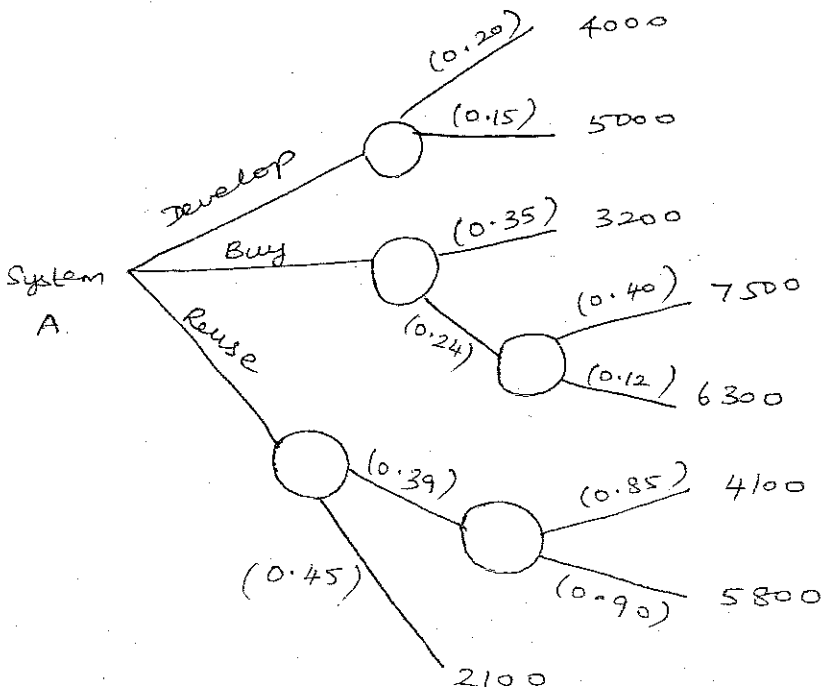
Version - A

Name:	ID No:	Sec / Prog:
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1. Draw a Graph Matrix corresponding to the flow graph and compute the Cyclomatic Complexity by applying number of regions and predicate nodes. 2M



2. For the given software based system A, calculate the expected cost for develop, buy and reuse of the decision tree. 3M



3. Draw the UML Sequence diagram for Enroll in University.

BITS PILANI, DUBAI CAMPUS
SECOND SEMESTER 2010- 2011

Course Code: BITS C461
 Course Title: Software Engineering
 Duration: 20 minutes

IV.YEAR

Date: 28.02.2011
 Max Marks: 16
 Weightage: 8 %

Version - A

Name:	ID No:	Sec / Prog:
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Instructions:

Write the answers in the tabulation given below:

Qns. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ans.																

1. Software that makes use of non-numerical algorithm to solve complex problems that are not amenable to computation is termed as.

a) Embedded Software	b) Artificial Intelligence Software
c) Product-Line Software	d) Application Software

2. Software is developed or engineered.

a) True	b) False
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3. Web Apps should be.

a) Network Intensive	b) Data Driven
c) Concurrent	d) all of the above

4. Legacy system exhibits

a) Convoluted Code	b) Extensive Design
c) Poor Documentation	d) both a and b

5. Requirements engineering tools assist in requirements gathering, requirements modeling, requirements management and requirements validation.

a) True	b) False
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6. The broad spectrum of tasks and techniques that leads to an understanding of requirements is called.

a) Requirements Gathering	b) Requirements Management
c) Requirements Engineering	d) Requirements Validation

7. Which examines the specification to ensure that all software requirements have been stated unambiguously, that inconsistencies, omissions and errors have been detected and corrected.

a) Requirements Elaboration	b) Requirements Specification
c) Requirements Negotiation	d) Requirements Validation

8. Which layer forms the basis for management control of software projects and establishes the context in which technical methods are applied, work products are produced, milestones are established, quality is ensured, and change is properly managed.
- a) Methods
 - b) Tools
 - c) Process
 - d) Software
9. Which process flow executes the framework activities in a circular manner?
- a) Linear
 - b) Parallel
 - c) Evolutionary
 - d) Iterative
10. Which pattern type defines the sequence of framework activities that occurs within the process, even when the overall flow of activities is iterative in nature?
- a) Stage Pattern
 - b) Phase Pattern
 - c) Task Pattern
 - d) Pattern Template
11. Which life cycle model begins with customer specification of requirements and progresses through planning, modeling, construction and deployment?
- a) Waterfall Model
 - b) Incremental Process Model
 - c) Evolutionary Process Model
 - d) Spiral Model
12. Which model combines elements of linear and parallel process flows?
- a) Waterfall Model
 - b) Spiral Model
 - c) Evolutionary Process Model
 - d) Incremental Process Model
13. When a customer has a legitimate need, but is clueless about the details, which model would you suggest?
- a) V Model
 - b) Prototype
 - c) Incremental Process Model
 - d) Spiral Model
14. Development of formal models is fast and cheaper.
- a) True
 - b) False
15. Which uses a concept of horizontal slices through vertically decomposed software components called “aspects” to characterize cross-cutting functional and non-functional properties of components?
- a) SCAMPI
 - b) SPICE
 - c) CBAIPI
 - d) AOCE
16. Which model is more appropriate for product engineering projects where different engineering teams are involved?
- a) V Model
 - b) Concurrent
 - c) Spiral
 - d) Prototype