

**BITS, PILANI – DUBAI CAMPUS**  
Knowledge Village, Dubai  
BE (Hons) CS/EEE/EIE III Year - 1<sup>ST</sup> Sem

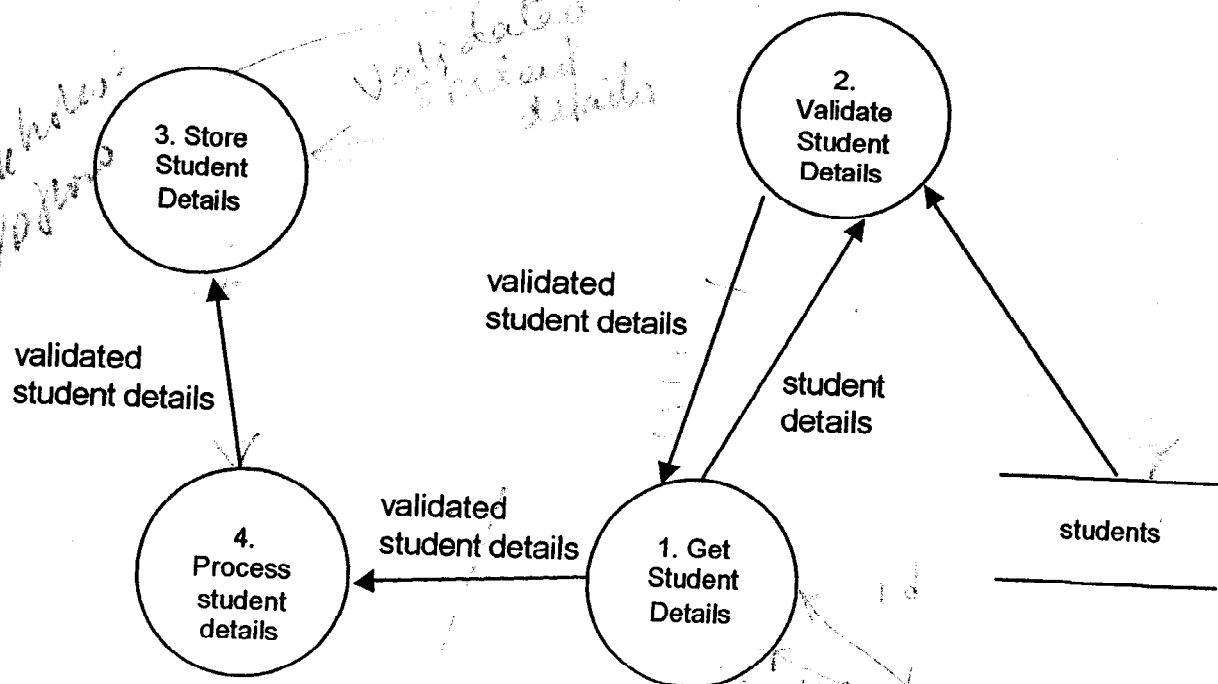
**Software Engineering – BITS UC461**  
**Test 1**

**Date: 24 Sep 2006**  
**Time: 50 min**

**Max Marks: 20**

**Answer all questions**

1. When can a system be amenable to the prototyping model? 1 mk
2. What is the main difference between framework and the umbrella activities. List five activities under each head. 4 mks
3. Enumerate any five functional and non-functional requirements in building a library information system. 5mks
4. What is an entity-relationship diagram? When would it be used? Give all the symbols used to draw ER diagrams. 4 mks
5. Develop a use-case for making a withdrawal at an ATM. 3 mks
6. Comment on the problems in the following DFD 3 mks



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**Software Engineering – BITS UC461**  
**Quiz (A) - SOLUTION**

**Date: 09 Nov 2006**

**Time: 30 min**

**Max Marks: 20**

**ROLL NO: \_\_\_\_\_ NAME: \_\_\_\_\_**

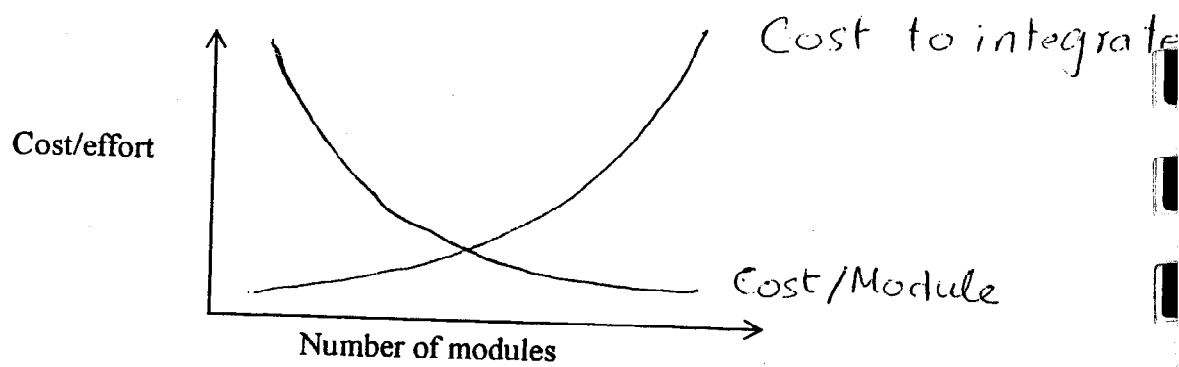
**Note: Answer all questions**

**I. State whether true or false (10 mks)**

1. Sequential ordering of tasks is inherent in a structure chart and is suppressed in a flow chart. (F)
2. A good software designer should decompose a problem in to modules such that they have high cohesion and low coupling (T)
3. Persistent objects usually get destroyed once a program finishes execution. (F)
4. The chronological order of messages cannot be determined in a sequence diagram(F)
5. Inheritance feature of the object oriented paradigm helps in code reuse. (T)
6. A row in a decision table is called a rule (F)
7. A blackboard resides at the centre of a data flow architecture (F)
8. A component diagram focuses on the placement and configuration of components at run time.(F)
9. Refactoring is the process of changing a software system in such a way that it does not alter the external behavior of the code yet improves the internal structure.(T)
10. An abstract class is a good example of information hiding (T)

**II. Short Answers**

1. Give any two problems encountered during requirements elicitation 2 mks  
Problem of scope, problem of understanding, problem of volatility
2. List any two principles that should be applied when building any user interface 2 mks  
Place the user in control, reduce the user's memory load, make the interface consistent
3. Plot a graph for cost/module and cost to integrate modules on the graph below 2 mks



4. What are the elements used to model concurrency in an activity diagram. Give an example. 2 mks  
 Fork and join. Any example showing concurrent processing

5. How is a transaction flow different from a transform flow in a data flow diagram? 2 mks

In a transform flow the overall flow of data occurs in a sequential manner and follows a straight line path. In a transaction flow a single data item called a transaction triggers data flow along one of many paths.

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**SOFTWARE ENGINEERING – BITS UC461**  
**COMPREHENSIVE EXAMINATION (Closed Book)**

Date: 20 Dec 2006  
Time: 3 hrs

Max Marks: 80

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Answer all questions

**Part A (20 mks)**

All questions carry equal marks

1. What are the major phases in the RAD model. Show how the effort spent in the different phases of the RAD model is spread over time.
2. Distinguish between functional and non-functional requirements
3. Are stepwise refinement and factoring the same thing? Justify your answer.
4. What are the drivers and stub modules in the context of unit testing of a software product.
5. What is a persistent data store?
6. A legacy system has 940 modules. The latest release required that 90 of these modules be changed. In addition, 40 new modules were added and 12 old modules were removed. Compute the software maturity index for the system.
7. Distinguish between alpha and beta testing
8. Define “mean time between failure” and “availability” in light of software reliability
9. What points are to be kept in mind while designing a user interface.
10. What is a CASE tool?

**Part B (60 mks)**

11. You have been asked to build a network based course registration system for BPDC.
  - a. Describe the data objects, relationships and attributes. 5 mks
  - b. Draw the context level diagram. Expand it into a DFD for Level 1 5 mks
12. Draw the flow chart and the control flow graph for the function named find\_maximum. From the control flow graph, determine its cyclomatic complexity. 10mks

```

int find_maximum(int i, int j, int k)
{
    int max;
    if (i > j) then
        if (i > k) then max = i;
        else max = k;
    else if (j > k) max = j;
    else max = k;
    return (max);
}

```

13. What do you understand by software configuration? What is meant by software configuration management? Assume that you are the manager of a project. What baselines would you define for the project and how would you control them?  
10 mks
14. An airline ticket reservation system is to be built. The system should allow a customer to specify the origin and destination of travel, preferences on the departing and returning dates, the time of the day for departure, and the airline carriers. The system will display the availability and information of the flights matching the customer's requirements. The customer may then proceed to choose the flights, select the seats, and purchase the tickets.  
10 mks
  - a. Determine the actors and use cases of the system, and describe the relationships among them using use case diagrams
  - b. Identify the classes of the system, and describe them using a class diagram
15. Write short notes on the following:  
10 mks
  - a. function point
  - b. COCOMO
16. What is an interaction diagram? Explain with the help of an example the various kinds of interaction diagrams  
10 mks

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**Software Engineering – BITS UC461**  
**Test 2 (Open Book)**

**Date: 12 Nov 2006**

**Time: 50 min**

**Max Marks: 20**

**ROLL NO: \_\_\_\_\_ NAME: \_\_\_\_\_**

**Note: Answer all questions**

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1. Discuss the relationship between the concept of information hiding and public and private attributes/methods of a class. 5 mks
2. Present two or three examples of applications for each of the architectural styles. 10 mks
3. Consider the following scenario that takes place in MacroHard Organisation to approve a budget 5 mks
  - The Budget Holder submits a proposed Budget for approval to the Financial Controller (FC)
  - The FC reviews the proposed Budget value to see if it is in line with the Capital Program and agrees to the Budget.
  - The FC sets the approval date for the Budget
  - The Capital Program is updated to reflect this approved Budget value
  - The FC notifies the Budget Holder that approval has been granted for the proposed Budget submission.

The main classes/objects here are Budget Holder, Budget, Financial Controller and Capital Program. Draw a sequence diagram showing the message sequence for budget approval.