K.L.E. Society's
B.V. Bhoomaraddi College of Engineering & Technology, Hubli
DEPARTMENT OF ISE

Minor Exam: I | **Semester:** VI
Course: Advanced Software Engineering | **Course Code:** 07ISC601
Date: 14-03-2011 | **Time:** 8:45 AM to 10:00 AM

Q1a. A program reads three integer values. The three values are interpreted as representing the lengths of the sides of a triangle. The program prints a message that states whether the triangle is scalene, isosceles or equilateral. Develop a set of test cases that you feel will adequately test this program **8 M**

b. Explain top-down and bottom-up integration testing. List the advantages and disadvantages. **8 M**

c. Why is a highly coupled module difficult to unit test? **4 M**

Q2a. Draw the flow graph for the following code snippet/procedure. Find the cyclomatic complexity and List all the independent paths. **8 M**

i)
```
Do
{
   if (A) then {...};
   else {
      if (B) then {
                if (C) then {...};
                else {…}
      }
      else if (D) then {...};
            else {...};
   }
}
While (E);
```

ii)
```
Procedure: reserveVideoCopy return(result)
If (status = "available") OR ( (status = "rented") AND (returnDate ≤ requestDate) )
        status = "reserved"
        link video copy instance to member instance
        result = "success"
Else
        result = "failure"
Endif
End
```

b. Explain the steps used in the cost estimation of object oriented projects. **6 M**

c. Define system testing. Describe various types of system testing. **6 M**

Q3a. Use the COCOMO II model to estimate the effort required to build software for a simple ATM that produces 12 screens (5 simple, 5 medium, 2 difficult), 10 reports (5 simple, 5 difficult) and will require approximately 80 software components. Assume 30 % code reusability and high developer/environment maturity. **6 M**

b. With an example, explain the following test case design techniques for the class.
i) Random class testing ii) Partition Testing **8 M**

c. The specification for a spelling checker program is as follows: The checker accepts two external inputs: a document file name and a personal dictionary file name; these refer to the two external files used by the system. The major output of the checker is a list of misspelt words, i.e. all words not contained in either the dictionary or personal dictionary files. Two other outputs are a 'number of words processed' message and 'number of words used from personal dictionary' message. At any point in the checking process, the user can query the number of words processed and the number of spelling errors. The standard dictionary file used by the checker is considered an internal logical file. The complexity of each data type is rated as average, except 'standard dictionary file' and 'list of misspelt words' which are considered complex. Estimate function points for the above specification if sum of value adjustment factors i.e. S(Fi) as 28. **6 M**

SCHEME OF EVALUATION

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Q1a. Any 8 important classes of test cases X 8 = **8M**

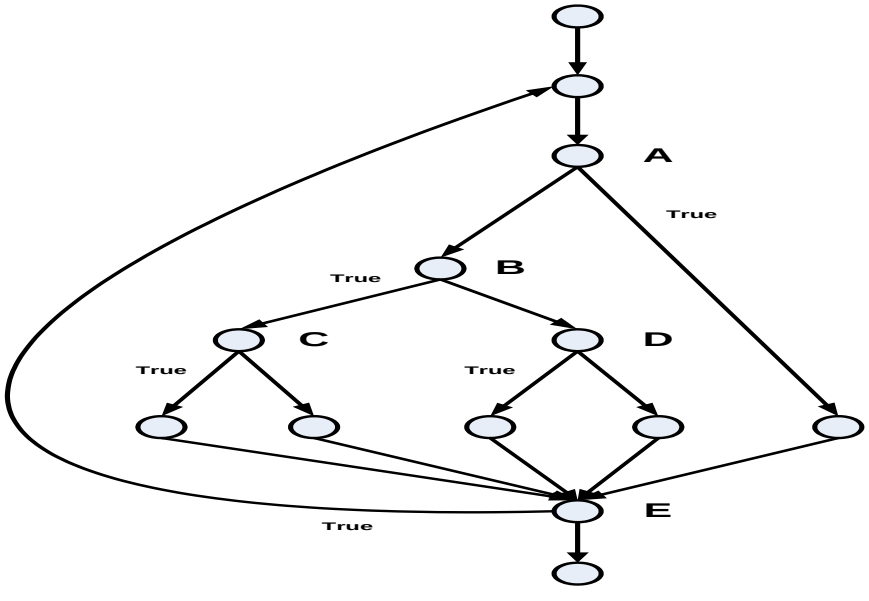
Tests	Inputs	Expected Results
There are less than three elements of the input set	(1,2)	Error Message
There are more than three elements of the input set	(2,4,5,8)	Error Message
Any element of an input set is a combination of any of the invalid inputs	(1A, 3,4), (4,/W",8) (2,4,:)	Error Message
The sum of two numbers equals the third in any of three permutations a+b=c, a+c=b, b+c=a	(2,4,6), (4,9,5), (8,4,4)	Error Message
The sum of two numbers is less than the third in any of three permutations a+b<="" td="">	(3,3,8), (2,5,1), (7,3,3)	Error Message
If all three digits of a valid input are the same the program displays that it has recognized an "equilateral" triangle	(5,5,5)	Equilateral !
If any two of the digits of a valid input are the same the program displays that it has recognized an "isosceles" triangle	(3,3,4),(7,8,7),(5,6,6)	Isosceles !
If each digit of a valid input is different the program displays that it has recognized a "scalene" triangle.	(3,4,5), (3,5,4), (5,4,3)	Scalene !

b. Diagram=02 M
Explanation=03 M
Advantages and Disadvantages=03

c. Highly coupled module's functionality is often dependent of the operation of those coupled elements. In order to thoroughly unit test such a module, the function of the coupled elements must be simulated in some manner. This can be difficult and time consuming.

Q2a.

i)



ii)

b. Six steps X 1M = 06 M
c. Definition =02 M
Four types X 1 M = 04 M

Q3a. 5 simple screens x 1 = 5
5 medium screens x 2 = 10
2 difficult screens x 3 = 6
5 simple reports x 2 = 10
5 difficult report x 8 = 40
80 3GL components x10= 800

Total Object points =871 **02 M**

If we assume 30% reuse

NOP = (object points) * [(100 - %reuse)/100]
= (871) * [(100 – 30)/100] = 871 * .7 = 610 **02 M**

PROD = 25

The estimated effort in person months is

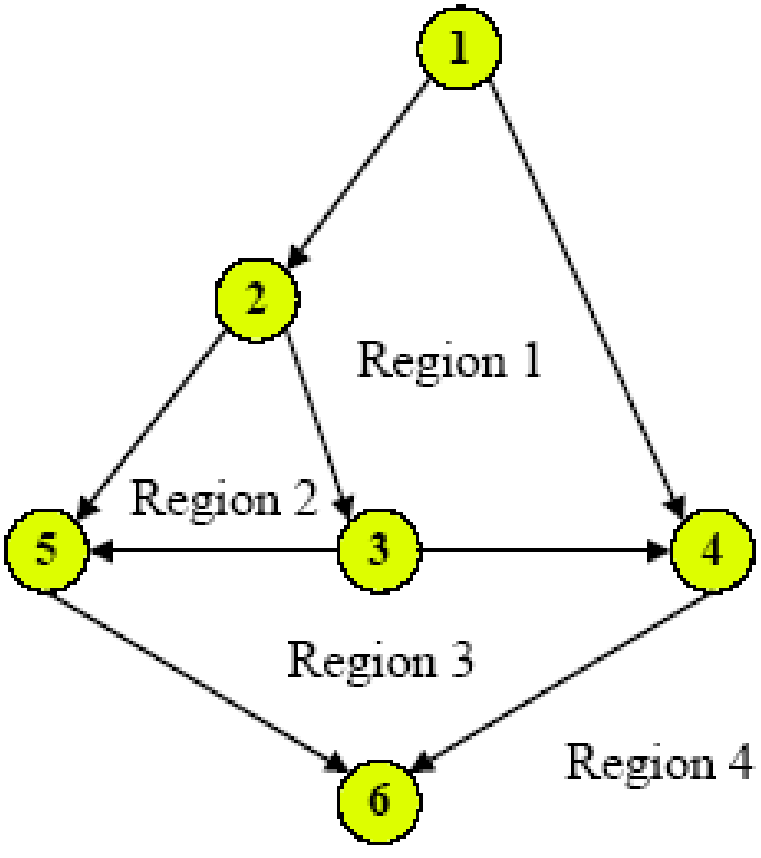
estimated effort = NOP/PROD = 610 /25 = 25 PM **02 M**

b. i) Random class testing
Explanation=**02 M**
Example = **02 M**
ii) Partition Testing
Explanation=**02 M**
Example =**02 M**

c. no. of External inputs: 2 (average)
no. of external outputs: 3 (2 average + 1 complex)
no. of inquires : 2 (average)
no. of external file: 2 (average)
no. of internal files: 1 (complex)

FP = 2(4) + 2(5) + 1(7) + 2(4) + 2(10) + 1(10) **04 M**
= 63
$FP_{Estimated}$ = .65 + 0.01(28) **02 M**
= 58.59

Procedure: reserveVideoCopy



V(G)=4

Flow graph node to statement mapping

1. 1a
2. 1b
3. 1c
4. 2, 3, 4
5. 5, 6
6. 7

Basis set:

1. 1 4 6
2. 1 2 3 4 6
3. 1 2 3 5 6
4. 1 2 5 6