

**GANPAT UNIVERSITY**  
**B.TECH. SEM. VII CE**  
**REGULAR EXAMINATION NOV/DEC- 2012**  
**CE705: SOFTWARE TESTING**

Max Time: 3 Hour]

[Total Marks: 70]

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Answer Both Sections in Separate Answer sheets.

**SECTION - I****Q-1 Answer the following questions.**[12]  
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- [A]**
1. input(X,Y)
  2. while (Y>0) {
  3. if (X>0)
  4. Y := Y-X
  - else
  5. input(X)
  6. }
  7. output(X,Y)
1. Identify all c-uses and p-uses for variable X
  2. For each c-use or p-use, identify all def-clear paths
  3. Identify whether or not each def-clear path is feasible, and whether or not it is a du-path

**[B]**

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
F1	*					*				
F2				*			*	*	*	
F3		*			*	*				*
F4							*			
F5		*						*	*	
F6				*						
F7				*	*					
F8		*	*							
F9						*				
F10	*								*	

For given test case fault exposure table, calculate its APFD with following order of Test suite:

- a. (T4, T2, T1, T7, T6, T9, T10, T5, T8, T3)
  - b. (T1, T2, T5, T4, T3, T6, T9, T8, T7, T10)
- What is the effect of changing the order of test
- Total no. of test cases = total no. of faults = 10

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**OR****Q.1****[A]**

1. input(A,B)
- if (B>1) {
2. A = A+7
- }
3. if (A>10) {
4. B = A+B
- }
5. output(A,B)

Consider a test case executing path: &lt;1,2,3,4,5&gt;

1. Identify all def-clear paths covered (ie subsumed) by this path for each variable
2. Are all definitions for each variable associated with at least one of the subsumed def-clear paths?

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- [B]** Calculate the total test points for a module whose specifications are : function points = 1600, ratings for all FDCw factors are normal, uniformity factor = 1, rating for all QCdw are 'very important' and for QCsw, three static qualities are considered.

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- [C] Consider the a project with following distribution of data and calculate its defect spoilage and defect density at each phase considering FP= 950 for the system.

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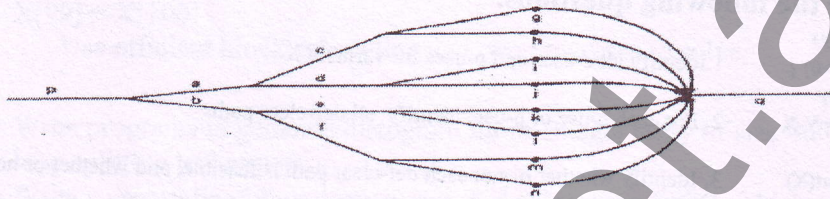
SDLC Phase	No. of Defects	Defect Age
Requirement Spec.	43	3
HLD	20	4
LLD	24	5
Coding	15	6

**Q-2 Answer the following questions.**

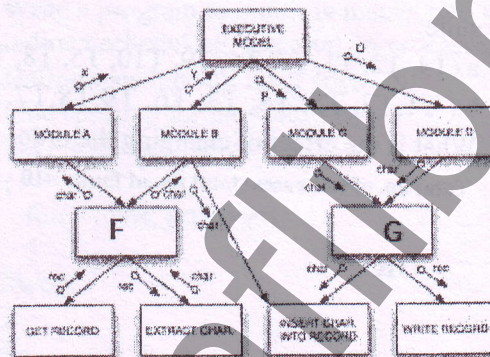
[11]

- [A] Using the reduction procedure convert flow graph whose links are labeled into path expression. Explain each step with flow graph as shown in figure.

5



[B]



For modules B, F & G compute:

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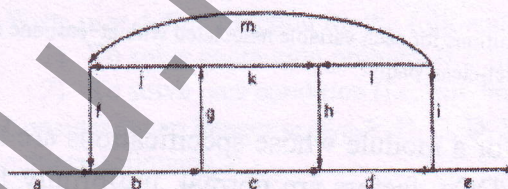
1. Structural Complexity
2. Data Complexity
3. IFC

**Q-2**

**OR**

[11]

[A]

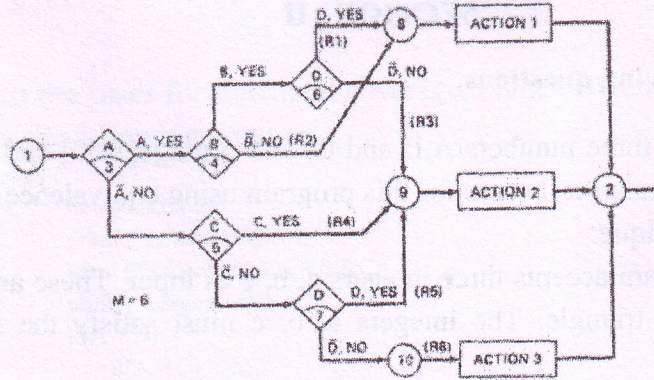


Using the reduction procedure convert flow graph whose links are labeled into path expression to calculate min path count. Assume each outer loop iterates thrice and inner loop iterates twice.

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[B]



Derive path expression for node N8, N9, N10 and N2. Apply rules of Boolean algebra to reduce the terms in expression.

[C] Take two modules of your choice of BTP1 and prepare following for each module :

1. Test procedure specifications
2. Test result specification

Q-3 Answer the following question.

[A] 1. Total test script developed 1360, total test script executed 1280, total test script passed 1065, total test script failed 215. Calculate test case defect density.

2. Customer filed defects are 21, total defect found while testing are 267, total number of invalid defects are 17. Calculate slippage ratio

[B] 

```
for ( j=1; j<N; j++) {
    last = N - j + 1;
    for (k=1; k<last; k++) {
        if (list[k] > list[k+1]) {
            temp = list[k];
            list[k] = list[k+1];
            list[k+1] = temp;
        }
    }
}
```

Compute program length using Halstead metrics.

[C] Identify whether mutant is alive or killed for each mutant using mutation testing.

Code :

```
int foo(int x, y) {
    return(x-y); }
```

Test case set T = { <t1 : x= 1, y= 0>, <t2 : x= -1, y=0> }

Mutants:

M1	M2	M2
int foo(int x, y) { return(x+y); }	int foo(int x, y) { return(x-0); }	int foo(int x, y) { return(0+y); }



## SECTION - II

**Q-4 Answer the following questions.**

[12]

[A] A program reads three numbers A,B and C with a range[1,50] and prints the largest number. Design test cases for this program using equivalence class and BVA testing technique. 6

[B] The triangle program accepts three integers a, b, c as input. These are taken to be the sides of a triangle. The integers a, b, c must satisfy the Following condition: 6

$$C1: 1 \leq a \leq 200$$

$$C4: a < b + c$$

$$C2: 1 \leq b \leq 200$$

$$C5: b < a + c$$

$$C3: 1 \leq c \leq 200$$

$$C6: c < a + b$$

The output of the program may be : Equilateral, Isosceles, Scalene or "NOT-A-TRIANGLE".

Design test case using Cause- Effect graph technique.

OR

**Q-4 Answer the following questions.**

[12]

[A] 

```
void foo( int a,b,c,d,e) {  
    if ( a == 0) { return; }  
    int x = 0;  
    if (( a == b) or ( c == d) ) {  
        x = 1 ; } e = 1/x; }  
List the test case for statement coverage, branch coverage and condition coverage.
```

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[B] A wholesaler has three commodities to sell and has three types of customers. Discount is given as per following procedure : 6

1. For DGS & D orders, 10% discount is given irrespective of the value of the order.
2. For orders of more than Rs. 50,000, agents get a discount of 15% and the retailer gets discount of 10%
3. For orders of Rs. 20,000 or more and up to Rs. 50,000 agents get 12% and the retailer gets 8% discount
4. For orders of less than Rs. 20,000, agents get 8% and the retailer gets 5% discount.

The above rules do not apply to furniture items wherein a flat rate of 10% discount is admissible to all customers irrespective of the value of the order.

Design the test cases for this system using decision table testing.

**Q-5 Answer the following questions.**

[11]

[A] Write a program for calculating the factorial of a number. It consist of main program and a module fact().Calculate the individual cyclomatic complexity number for main() and fact() and then,cyclomatic complexity of for the whole program. 6



- [B] List the cases for statement coverage, branch coverage and condition coverage for the following program 5

```
main() {  
    float A,B,C;  
    printf("Enter 3 values");  
    scanf ("%d%d%d",&A,&B,&C);  
    printf("Largest value is:");  
    if(A > B){  
        if(A > C)  
            printf("%d\n",A);  
        else  
            printf("%d\n",C);  
    }  
    else {  
        if(C>B)  
            printf("%d",C);  
        else  
            printf("%f",B); } }
```

OR

- Q-5 Answer the following questions. [11]

- [A] Write the program in C to define whether entered number is prime number or not ? Do following : 6

1. Draw Control flow graph and calculate cyclomatic complexity of the program using all methods.

List all independent paths and design test case from independent paths.

- [B] Perform Equivalence Partitioning and BVA on following requirement and design test cases: 5

"When a user lands on the "Go to Jail" cell, the player goes directly to jail, does not pass go, does not collect \$200. On the next turn, the player must pay \$50 to get out of jail and does not roll the dice or advance. If the player does not have enough money, he or she is out of the game."

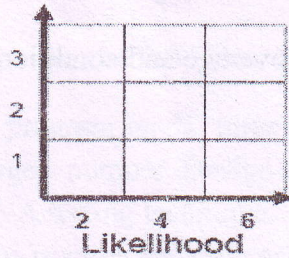
- Q-6 Answer the following questions. [12]

- [A] Evaluate the requirements and suggest improvements where necessary: 4

1. The boat shall be equipped with a means of determining the boat's heading relative to the wind.
2. A crew of 2 shall be able to control the boat when sailing in wind up to force 6 Beaufort.
3. The boat shall be supplied with a checklist that the crew can use to verify that the boat is properly rigged and ready for launch, and that all safety equipment is properly stowed.
4. The boat shall be provided with sufficient buoyancy to enable it to be sailed by two people with a combined weight in the range 140 pounds to 400 pounds.



[B] Impact



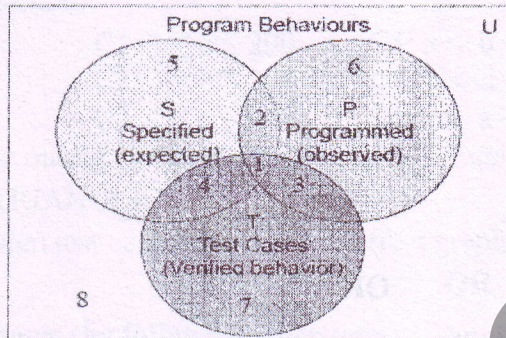
Compute & fill up the matrix for each of following :

4

1. High Impact and High likelihood
2. High Impact
3. High Likelihood Risk number (RN) for risk

prioritization . Take  $\alpha = 1.5$

[C]



In the Venn diagram identify the regions that corresponds to:

4

1. Incomplete testing
2. Incomplete specification

Justify your answer for each.

End of Paper