Seat No_____

GANPAT UNIVERSITY
B.TECH. SEM. VII CE
REGULAR EXAMINATION NOV/DEC– 2011
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]**

[A] There are 1200 estimated function points in a project. Calculate the total number of test cases in the system and the number of test cases in acceptance testing. Also calculate the defect density (number of total defects is 236) and test case coverage. **4**

[B] The historical record of some similar type of projects are shown below : **4**

Number of test Procedures	Number of person-hours consumed for testing
866	4500
870	4512
956	4578
903	4520
790	4460

If a new project of similar types is to be developed for which the number of test procedures are 1245, calculate the number of testers required if the total period of testing scheduled is 2050 hours.

[C] Take the two modules of your choice in a project (BTP) and prepare following for each module : **4**

1. Test Design Specification
2. Test Case Specification
3. Test Procedure Specification
4. Test Result Specification

OR

Q-1 Answer the following questions. **[12]**

[A] Consider the project with following distribution of data and calculate its defect spoilage and defect density at each phase considering FP= 980 for the system. **4**

SDLC Phase	No. of Defects	Defect Age
Requirement Spec.	34	2
HLD	25	4
LLD	17	5
Coding	10	6

[B] In a software project, 2050 test cases were planned out of which 1980 were executed till date. During execution of these test cases, bugs were found with following details : 4

Bug Ref. Id	Bug Opening Date	Bug Closing Date
M01-01	09-10-2007	10-10-2007
M01-02	12-10-2007	12-10-2007
M01-03	11-10-2007	14-10-2007
M02-01	13-10-2007	14-10-2007
M02-02	13-10-2007	15-10-2007
M02-03	14-10-2007	16-10-2007
M02-04	15-10-2007	15-10-2007
M02-05	17-10-2007	20-10-2007
M02-06	17-10-2007	19-10-2007

Compute the following for this project :

1. Test Procedure execution status
2. Turnaround time for a defect to be corrected
3. Bug Trend Analysis for defects per day that can be fixed
4. TCE

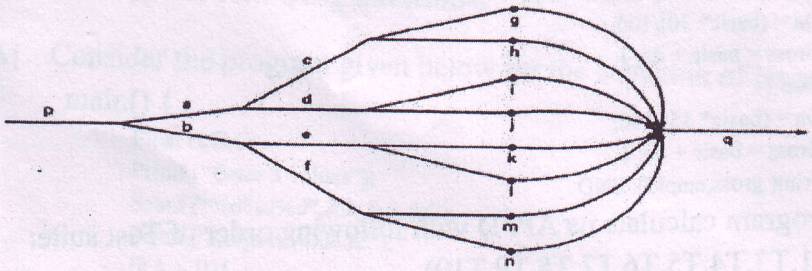
[C] Calculate the total test points for the functions of software. The specifications of all the modules are given in the table below : 4

Function	Specification
M01	Function points= 234, Ratings for all FDC_w factors are high. Uniformity factor =1, rating for all QC_{dw} are 'important' and for QC_{sw}, two static qualities are considered.
M02	Function points= 340, Ratings for all FDC_w factors are normal. Uniformity factor =1, rating for all QC_{dw} are 'very important' and for QC_{sw}, three static qualities are considered.
M03	Function points= 450, Ratings for all FDC_w factors are high. Uniformity factor =1, rating for all QC_{dw} are 'important' and for QC_{sw}, two static qualities are considered.

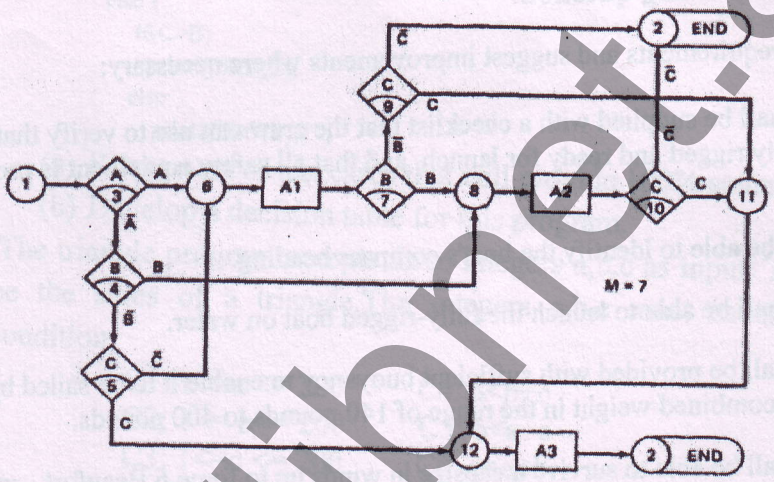
Q-2 Answer the following questions. **[11]**

[A] Consider a project with following parameters. EI=60, EO=40, EQ=45, ILF=06 and ELF=08. Assume all weighing factors are average. In addition, system requires significant data communication, performance is very critical, designed code may be Moderately reusable and other GSCs are average. Compute Function Point using FPA. 3

[B] Using the reduction procedure convert flow graph whose links are labeled into path expression. Explain each step with flow graph as shown in figure. 4



[C] 4

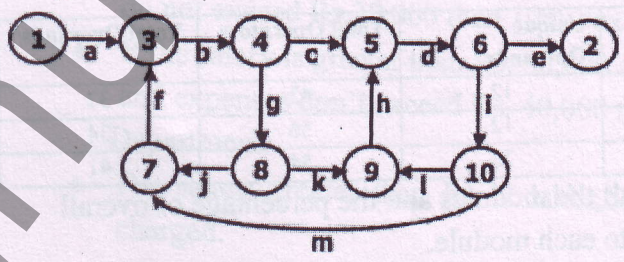


Derive path expression for node N6, N8, N2, N11 and N12. Apply rules of Boolean algebra to reduce the terms in expression.

Q-2 **OR** [11]

[A] Consider a project with following parameters. EI (simple) =30, EO (average)=20, EQ(average)=35, ILF(complex)=08 and ELF(complex)=05. In addition, the system requires significant end user efficiency, moderate distributed data processing, critical data communication and other GSCs are incidental. Compute Function Point using FPA. 3

[B] 4



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

[C] 4

```
Begin
S1:   Read (basic, empid)
S2:   Gross =0;
S3:   If (basic > 5000 || empid > 0 ) {
S4:   Da = (basic* 30)/100;
S5:   Gross = basic + da; }
S6:   Else {
S7:   Da = (basic* 15)/100;
S8:   Gross = basic + da; }
S9:   Print( gross,empid); END
```

For above program calculate its APFD with following order of Test suite:

a. (T2,T1,T3,T4,T5,T6,T7,T8,T9,T10)

b. (T1,T2,T5,T4,T3,T6,T9,T8,T7,T10)

What is the effect of changing the order of test cases.

Q-3 Answer the following question. [12]

[A] Evaluate the requirements and suggest improvements where necessary: 3

1. 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.

2. Crew shall be able to identify the boat's compass heading.

3. The crew shall be able to launch the fully-rigged boat on water.

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 of 140 pounds to 400 pounds.

5. The boat shall be able to survive a capsize in winds up to force 6 Beaufort.

6. The boat shall be colored fluorescent orange below the waterline.

7. The design shall comply with the International Shipping Regulations, issue 5 (1997).

8. The boat shall be provided with the means by which the crew shall be able to get ashore in the absence of wind.

[B] The module implementation details of software project are given below: 4

Module	Unique Operator	Unique Operands	Total Operators	Total Operands
A	23	12	43	37
B	34	12	56	34
C	12	23	54	41

Calculate Halstead effort for all the modules and the percentage of overall testing efforts to be allocated to each module.

[C] Draw schematic diagram for Test Plan Hierarchy. 2

[D] Compute Halstead Bug predication for **Q.3 [B]** tabled data. 3

SECTION - II

Q-4 Answer the following questions. [12]

[A] Consider the program given below for the selection of largest number. 6

```
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);} }
```

(a) Select a set of test cases that will provide 100% statement coverage.

(b) Develop a decision table for this program.

[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<=a <= 200 C4: a<b+c

C2: 1<= b<= 200 C5: b<a+c

C3: 1<=c <= 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] Design the set of test cases using BVA technique and equivalence class testing technique for selection of largest number program in Q.1[A] 6

[B] Consider the Payroll System of a Person: 6

- If the salary of a person is less than equal to Rs 70,000 and expenses do not exceed Rs.30,000 then 10% tax is charged by IT department.
- If the salary is greater than Rs. 60,000 and less than equal to Rs 2 lacs and expenses don't exceed Rs. 40,000 than 20% tax is charged by IT Department.
- For salary greater than Rs. 2 lakhs,5% additional surcharge is also charged.
- If expenses are greater than Rs. 40,000 surcharge is 9%.

Design Test-cases using **cause effect graph** technique.

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

[A] Write the program that reads a,b,c as three coefficients of a quadratic equation $ax^2+bx+c=0$. It determines the nature of roots of this equation. Draw its flow graph and calculate its cyclomatic complexity and design the test cases for each independent path. **6**

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

```
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; }
```

OR

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

[A] Write program to count the number of characters, blanks, tabs in a line. Perform the following : **6**

1.Draw its flow graph
2. Draw its DD path graph
3. Find its V(G)
4.Identify du-path
5. Identify dc-path.

[B] Calculate cyclomatic complexity and design the test cases for each independent path. **5**

```
complexity5( int i) {
if (n>o) {
switch(n) {
case 0: case1: printf("zero or one\n");
break;
case2: printf("two\n");
break;
case3: case4: printf("three or four\n");
break;
}} else
printf ("negative\n"); }
```

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

[A] Draw V Model of software Testing with details. **3**

[B] Differentiate between Error and Fault? **2**

[C] Draw classification chart of Verification and Validation Techniques. **3**

[D] Write Test Case Template with suitable example. **2**

[E] Why Validation is more difficult than Verification? **2**

End of Paper

6/6