Subject code: CS6404   **Subject Name:** Software Testing   **Dept. Code:** CS
No. of pages: 2   **Full Marks:** 100   **Duration:** 3hours

Q1.   **2x10 = 20**

a. What is the difference between progressive testing and regressive testing?
b. What are the different regression testing types? Briefly explain them.
c. Write any two key elements of test management?
d. What is the difference between verification and validation of software?
e. Suppose, a test suite T contains 100 tests of which 20 are modification-revealing for programs P and P' and the technique M selects 8 of these 20 tests. Calculate the inclusiveness of M relative to P, P', and T.
f. State Weyukar's Anti-composition axiom.
g. For cluster level testing, which UML 2.x diagram is most suitable?
h. What do you understand by test log? Why is it used?
i. What do you mean by sprint? What is the normal duration of a sprint?
j. What do you mean by XSS?Why it is considered as a threat to the web based applications.

Q2.   **10x2 = 20**

a) Why regression test prioritization is used? Briefly explain the steps of regression test prioritization technique. Suggest some priority categories / levels based on which a given set of test cases can be prioritized.

b) What do you mean by dynamic slice? Consider the following code segment and test cases. Find the dynamic slice and test cases to rerun, if
  i. S_{10} is changed to " sum = a*b+sum; "
  ii. S_5 is changed to " sum = sum*b; "
  iii. S_8 is changed to " sum = sum*a; "

```
Begin
S1:    read (a,b);
S2:     sum=0;
S2.1:  I=0;
S3:    if (a==0)
       {
S4:         print(b);
S5:         sum+=b;
       }
S6:    else if(b==0)
       {
S7:         print(a);
S8:         sum+=a;
       }
S9:    else
       {
S10:        sum=a+b+sum;
S10.1             I=25;
S10.2
       print(I);
       }
S11:   endif
S12:   print(sum);
End
```

Test Case	a	b	sum
T1	0	4	4
T2	67	0	67
T3	23	23	46

Q3.   **20**

Consider the details of the following Medical Shop Management System.

Sl. No.	Functionality	Function ID in SRS	Test Cases
1	Login the System	F3.4	T1
2	View Inventory Details	F3.5	T2
3	Order Medicine	F3.6	T3
4	Manage Inventory	F3.7	T4
5	Exit the System	F3.8	T5

Develop the test specification, test log, test incident report and test summary report for 'View Inventory Details' functionality.

Q4.   **10 x 2 = 20**

a) Why APFD metric is used? Consider a program with 10 faults and a test suite of 10 test cases as shown below. Calculate its APFD values with the following order of test suite:

    i. (T1,T2,T3,T4,T5,T6,T7,T8,T9,T10)
    ii. (T2,T1,T3,T4,T5,T6,T7,T8,T9,T10)
    iii. (T1,T2,T5,T4,T3,T6,T9,T8,T7,T10)

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

b) What do you mean by fault exposing potential (FEP)? It depends on which factors? Discuss an approach for prioritizing test cases using the concept of FEP of a test case. The following table shows the FEP estimates of a program. Prioritize the test cases using FEP.

Statement	FEP(s,t) values		
	Test case 1	Test case 2	Test case 3
1	0.5	0.5	0.3
2	0.4	0.5	0.4
3		0.01	0.4
4		1.3	
5			
6	0.3		
7	0.6		0.1
8		0.8	0.2
9			0.6

Q5.   **10 x 2 = 20**

a) What are the implications of encapsulation, inheritance, polymorphism, and dynamic binding features of an object-oriented program in satisfactory testing of the program?

b) Briefly explain behavioral integration testing. Draw the state chart diagram for a Credit Card object. Generate behavioral test cases for Credit Card using the state chart diagram.

Q6.   **10 x 2 = 20**

a) Explain the differences between traditional software and web based software? Discuss the challenges in testing for web-based software.

b) Explain interface testing and content testing for web-based systems.

Q7.   **10 x 2 = 20**

a) Briefly discuss Scrum as an agile software development framework.

b) Explain how testing is carried out in the different phases of Scrum?