

**College Of Electronic Technology-Tripoli**

**Department of computer Engineering**

**Cs427 : Software testing fall 207-2018 final exam (2 hours)**

**Part 1. Please answer 4 questions only ( 9 marks each).**

**Q1. Define the following:**

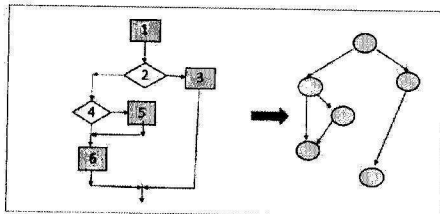
- 1- Software bugs.      2 – Software test case.      3- Cyclomatic complexity

**Q2. Complete the following sentences:**

- 1- Software testing can show only the ..... of failures, but not the ..... of them.
- 2- One of the golden rules in software testing is : .....
- 3- One of the reasons behind software testing is that The software ..... do something that the specification says it should do.
- 4- The concept of software observability can be simplified by the rule : what you ..... is what you .....
- 5- Some of main software testing activities are : test design , ..... , .....
- 6- Testing Maturity Model (TMM) has 5 levels: initial , phase definition, .....

**Q3. True or False ( with correction of false statements):**

- 1- Fault may hide inside a software and remain undetectable for long time.
- 2- Software code is the only source in which software bugs can be detected.
- 3- Verification is the process of confirming that a software component meets customer ( or user) requirements.
- 4- Regression -test is done to make sure weather the overall proposed system meets system specification.
- 5- Black-box testing is a logic driven testing.
- 6- The given flow graph was derived from the associated flowchart logic.



**Q4. List down the main topics should be included in any software testing plan.**

**Q5. Briefly explain one of the following topics:**

- 1- Regression testing.
- 2- Usability testing.

**Part2: answer one question only ( 24 marks each)**

**Q1.** Consider the following specifications:

The new students in third semester will be allocated to the college departments according to these rules:

- 1- The student will be allocated to **Communication** dept. if his **AVG  $\geq 85$**  or his **AVG  $\geq 65$**  but  **$< 85$**  with overall marks in **Math-2 subject  $\geq 75$** .
- 2- The student will be allocated to **Computer** dept. if his **AVG  $\geq 70$**  and his marks in **programming-1 subject  $\geq 75$** .
- 3- The student will be allocated to **Control** dept. if his **AVG  $\geq 65$**  and his marks in **Electronics-2 subject  $\geq 80$** .

- a- Identify a test case which not covered by the above specification.
- b- Apply the black-box testing techniques ( class partitioning , boundary value analysis) and show the result, provide test case samples in your answer.
- c- Update the above specification to correct it and fix up the possible bugs.

**Q2.**

```
public int countPositive (int[] x) {  
    //Effects: If x==null throw NullPointerException  
    // else return the number of  
    // positive elements in x.  
    int count = 0;  
    for (int i=0; i < x.length; i++)  
    {  
        if (x[i] >= 0)  
        {  
            count++;  
        }  
    }  
    return count;  
}  
// test: x=[-4, 2, 0, 2]  
// Expected = 2
```

For the given code find :

- (a) Identify the fault.
  - (b) If possible, identify a test case that does **not** execute the fault.
  - (c) If possible, identify a test case that executes the fault, but does **not** result in an error state.
  - (d) If possible identify a test case that results in an error, but **not** a failure.
- Hint: Don't forget about the program counter.

**Part3: answer the following question ( 30 marks )**

**Q1.**

Check the given code, then derive the flow graph and find the:

- a- Cyclomatic complexity.
- b- List of independent paths.

```
int a,b,c,p, i=0,x=0;  
while( i < 10 ) {  
    cin>>a>>b>>c;  
    if(a mod 2 == 0 )  
        x=x+2;  
    else  
        x=x/2  
    p=c/(b+1);  
    if(p > 3)  
        { z= x+5 ; cout<< z; }  
    i=i+1;  
} // of while
```