STIW3033 CONFIDENTIAL

UUM
Universiti Utara Malaysia

FINAL EXAMINATION
FIRST SEMESTER SESSION 2011/2012

COURSE CODE / NAME : STIW3033 SOFTWARE TESTING & QUALITY ASSURANCE
DATE : 19 JANUARY 2012 (THURSDAY)
TIME : 8.30 - 11.00P.M (2 ½ HOURS)
VENUE : DMS

INSTRUCTIONS :
1. This exam paper contains SECTION A (16 questions) and SECTION B (3 questions) in TWELVE (12) printed pages, excluding the cover page.
2. Answer ALL QUESTIONS on the space provided.
3. You are NOT ALLOWED to remove the exam paper from the examination hall.

MATRIC NO : ________________________________

( with word )

( with number )

IDENTIFICATION CARD NO : ________________

LECTURER : ________________________________

GROUP : __________________ TABLE NO : __________

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

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SECTION A (70 MARKS)

1. Provide TWO (2) differences between software testing and software quality.  
   \[ \text{(4 marks)} \]

2. Explain TWO (2) reasons that cause the major problems during software integration testing.  
   \[ \text{(4 marks)} \]

3. Explain TWO (2) purposes of having the software requirements traceability matrix in software development.  
   \[ \text{(4 marks)} \]
4. List **THREE** (3) strategies of incremental testing during software integration testing.  

   (3 marks)

5. Provide **ONE** (1) example for the following system testing:  

   a) Stress testing  

   b) Recovery testing  

   c) Security testing  

   (6 marks)

6. Explain **TWO** (2) differences between system testing and acceptance testing.  

   (4 marks)
The latest website http://www.elearning.uum.edu.my/ was tested as follows:

<table>
<thead>
<tr>
<th>User type</th>
<th>Percentage of user (%)</th>
<th>Session length (day)</th>
<th>User activity</th>
<th>Frequency per session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing</td>
<td>50</td>
<td>2</td>
<td>Validate respond to a report submission by displaying the next blank report form</td>
<td>3</td>
</tr>
</tbody>
</table>

Assuming 100000 users use the website, compute Transaction Per Second (TPS) based on the given table.

(4 marks)

8. Boehm (1981) suggested that the cost of correcting an error increased exponentially for each phase of the systems development life cycle the correction was delayed. In your opinion, why the researcher suggested in that way?

(4 marks)
9. List **THREE (3)** types of standard that normally apply in software preparing development.  

   (3 marks)

10. List **TWO (2)** categories of documentation in software development. Provide **ONE (1)** example for each category.  

    (4 marks)

11. List **TWO (2)** categories of software metrics. Provide **ONE (1)** example for each category.  

    (4 marks)
12. Procurement System comprises 40KLOC and took 100 days to implement. An amendment has led to 1000 LOC being added which took 25 days to implement. Based on the given statement, calculate percentage of extendibility of the system. Then, make conclusion based on the percentage of extendibility of the system.

(6 marks)

13. Describe a static analysis technique and provide TWO (2) examples of static analysis.

(4 marks)

14. Explain TWO (2) reasons why the software configuration management is required to be implemented in software development team.

(4 marks)
15. Differentiate three terminologies namely variation, version and revision. Provide TWO (2) software configuration tools that available in software development.  

(5 marks)

16. Describe TWO (2) differences between Capability Maturity Model (CMM) and Capability Maturity Model Integration (CMMI). Provide THREE (3) maturity characteristics of software process.  

(7 marks)
SECTION B (30 MARKS)

Question 1

Answer the following questions based on the Java code below.

```java
import java.util.Scanner;
public class Oracle
{
    public void answer()
    {
        System.out.println("What is your question?");
        Scanner keyboard = new Scanner(System.in);
        question = keyboard.nextLine();
        seekAdvice();
    }
}
```

a) Construct a driver to test the Oracle class. (5 marks)

b) Write a stub to test the seekAdvice() method. (3 marks)
Question 2

Based on the Java program and the output given, answer the following questions.

```java
import java.util.Scanner;
public class SpendingSpree{
    public static final int SPENDING_MONEY = 100;
    public static final int MAX_ITEMS = 3;
    public static void main(String[] args){
        Scanner keyboard = new Scanner(System.in);
        boolean haveMoney = true;
        int leftToSpend = SPENDING_MONEY;
        int totalSpent = 0;
        int itemNumber = 1;
        while (haveMoney && (itemNumber <= MAX_ITEMS))
        {
            System.out.println("You may buy up to " +
                                (MAX_ITEMS - itemNumber + 1) + " items");
            System.out.println("costing no more than $" +
                                leftToSpend + ".");
            System.out.print("Enter cost of item #" +
                                itemNumber + ":");
            int itemCost = keyboard.nextInt();
            if (itemCost <= leftToSpend)
            {
                System.out.println("You may buy this item.");
                totalSpent = totalSpent + itemCost;
                System.out.println("You spent $" +
                                    totalSpent + " so far.");
                leftToSpend = SPENDING_MONEY - totalSpent;
                if (leftToSpend > 0)
                
                    itemNumber++;
                else
                {
                    System.out.println("You are out of money.");
                    haveMoney = false;
                }
            }
            else
                System.out.println("You cannot buy");
        }
        System.out.println("You spent $" + totalSpent +
                            ", and are done shopping.");
    }
}
Output:

You may buy up to 3 items
costing no more than $100.
Enter cost of item #1: $80
You may buy this item.
You spent $80 so far.
You may buy up to 2 items
costing no more than $20.
Enter cost of item #2: $20
You may buy this item.
You spent $100 so far.
You are out of money.
You spent $100, and are done shopping.

a) Draw a flow graph for the given program.  

(8 marks)

b) Based on the constructed flow graph, list the predicates nodes and calculate the cyclomatic complexity value for the given program.  

(2 marks)
Question 3

Based on the following extract website, derive thoroughly **FOUR (4)** test cases for every page given.

(12 marks)

Page 1: Normal scenario for calculating mortgage payment.

**Mortgage Calculator**

- Mortgage amount: $165000
- Mortgage term: 30.000 years or 360 months
- Interest rate: 7% per year
- Mortgage start date: Oct 30, 2011
- Monthly Payments: $1097.75

Page 2: Exceptional Condition: Mortgage amount value is between 1 to 10000000.

**Mortgage Calculator**

- Mortgage amount: $1
- Please enter a value between 1 and 10000000.
- Mortgage term: 30.000 years or 360 months
- Interest rate: 7% per year
- Mortgage start date: Oct 30, 2011
- Monthly Payments: $
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Page 3: Exceptional condition- mortgage amount field is empty

Mortgage Calculator

Mortgage amount: $__________  *This field cannot be blank
Mortgage term: 30,000 years or 360 months
Interest rate: 7% per year
Mortgage start date: Oct 30, 2011
Monthly Payments: $

Calculate

Page 4: Exceptional Condition: Invalid data type for the mortgage amount field

Mortgage Calculator

Mortgage amount: $__________ *Please enter a numeric value.
Mortgage term: 30,000 years or 360 months
Interest rate: 7% per year
Mortgage start date: Oct 30, 2011
Monthly Payments: $

Calculate
Write your answer here: