



EAST WEST UNIVERSITY

Department of Computer Science and Engineering

B.Sc. in Computer Science and Engineering Program

Final Examination, Spring 2024 Semester

Course: CSE 430 Software Testing and Quality Assurance, Section 2

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Full Marks: 40 (Will be converted to 30)

Time: 1 Hour 15 minutes

Note: There are 6 (SIX) questions, answer ALL of them.

1. Consider the following program that calculates the Fibonacci sequence and determines whether the nth term is a prime number. [CO3 15 marks] [CO3, C3, Marks: 5+4+6 = 15]

1. Consider the following code which calculates the factorial of a number and then checks if that factorial is a perfect square: [CO3 15 marks]

```
#include <stdio.h>
```

```
int factorial(int n);  
int isPerfectSquare(int num);
```

```
int main() {
```

1. int n, fact;
2. printf("Enter the value of n: ");
3. scanf("%d", &n);
4. fact = factorial(n);
5. printf("The factorial of %d is: %d\n", n, fact);
6. if (isPerfectSquare(fact))
7. printf("%d is a perfect square.\n", fact);
8. else
9. printf("%d is not a perfect square.\n", fact);
10. return 0;
11. }

```
int factorial(int n) {
```

1. if (n == 0)
2. return 1;
3. else
4. return n * factorial(n - 1);
5. }

```
int isPerfectSquare(int num) {
```

1. int i = 1;
2. while (i * i < num) {
3. i++;
4. }
5. return i * i == num;
6. }

- (a) Draw the DD graph for the program.
- (b) Calculate the cyclomatic complexity of the program using all four methods.
- (c) List all independent paths.

2. What is Regression Testing? What is internal testing metrics? [CO3, C2, Marks: 1+2=3]

3. Let's consider a scenario where a travel agency is offering different travel packages based on the destination and the traveller's age group. Here are the partitions for testing the booking module: [CO2, C3, Marks: 8]

1. **Destination: Mountain Retreat:**

- Age < 18: Family Adventure Package (includes easy hiking trails and family-friendly activities)
- Age between 18 and 35: Extreme Adventure Package (includes mountain climbing and adrenaline-inducing activities)
- Age > 35: Scenic Package (includes guided tours and peaceful nature walks)

2. **Destination: City Tour:**

- Age < 18: Family Sightseeing Package (includes visits to child-friendly attractions and interactive tours)
- Age between 18 and 35: Cultural Experience Package (includes museum visits and nightlife experiences)
- Age > 35: Historical Tour Package (includes guided tours of historical landmarks and architectural wonders)

Write down test cases using **Domain testing** Technique

4. Integration Testing Consider a web-based e-commerce application that consists of several modules [CO3, C3, Marks: 7]

- Authentication Module
- Shopping Cart
 - Add to Cart (not developed yet)
 - Remove from Cart
- Order Management
 - Order
 - Order History (not developed yet)
 - Order Manager
- Payment Processing
 - Cash
 - Debit Card (not developed yet)
 - Credit Card
 - Mobile wallet (not developed yet)

In the given scenario, which type of **integration testing** would be performed and why?

5. Let's consider a manufacturing company that produces electronic devices, like smartphones. How should the company spend in Prevention cost and Appraisal cost to reduce internal failure cost and external failure cost? [CO3, C2, Marks: 5]
6. Consider a scenario where we're testing a ride-sharing app with various configuration parameters [CO2, C3, Marks: 7]
- a) Vehicle Type: {Sedan, SUV, Truck, Motorcycle, Bicycle}
 - b) Payment Method: {Credit Card, PayPal, Cash, Mobile Wallet}
 - c) Ride Distance can be from 1 mile to 10000 miles{Short, Medium, Long}
 - d) Weather: {Sunny, Snowy}

Now design test cases using **all-pair testing technique** for the given scenario.

Good Luck!