Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2024
Course Code: SE 111; Course Title: Computer Fundamentals
Sections & Teachers: All

Time: 2:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	***a)***	Imagine you are a healthcare assistant at a wellness center. Your task is to help classify people based on their Body Mass Index (BMI), which is calculated using the formula: BMI = (Height (m))^2 /Weight (kg) Based on their BMI, categorize them into one of the following health zones: Underweight: BMI < 18.5 Healthy Weight: 18.5 ≤ BMI ≤ 24.9 Overweight: 25 ≤ BMI ≤ 29.9 Obese: BMI ≥ 30 For classifying the person into the appropriate health zone **illustrate** an algorithm and **draw** flowchart to explain the process.	**13**	**CLO-3** ***C3***

	b)	**Detect** errors in the provided C code below, **update** the code after making the necessary corrections, and write down the updated code.
		
		Additionally, **show** the expected output when the input is:
		1. 15
		2. 10
		
		Code:
		
		`#Include <studio.h>`
		`INT main() {`
		`int 1_num;`
		`print("Enter a number: )`
		`scan("d", num)`
		`if (num % 3 = 0 || num % 5 = 0);`
		`{`
		`prnt("The number is divisible by both 3 and 5\m)`
		`}`
		`else {`
		`prnt("The number is not divisible by both 3 and 5\m)`
		`ret 0;`
		`}`
			7	

	c)	**Table: Student** | StudentID	Name	Age	CGPA	CourseID
025	Alice	22	3.50	101
059	Bob	23	3.65	102
009	Charlie	22	3.45	103
095	Mark	24	3.85	101 | **Table: Course** | CourseID	CourseName	Credit
---	---	---
101	Mathematics	3
102	Physics	1
103	English	2
105	Programming	4 | In the context of databases, two of the most significant keys are present. These keys are essential for ensuring data integrity and establishing relationships between tables. **Detect** the two keys from the above tables and **demonstrate** the difference between these two keys.	5	
	d)	Daffodil International University (DIU) has set up two different networks for its departments. Scenario 1: In the Software Engineering Department, all devices connect to a central hub, which also has a backup hub for redundancy. If both hubs fail, the network stops functioning. Scenario 2: In the Computer Science Department, each device is connected to every other device. This setup ensures communication continues even if one connection fails, but managing the connections is increasingly difficult as devices are added. **Determine** the network topology based on the given description, **provide** your reasoning and a diagram for each topology.	5	
2.	*a)*	Story 1: An online health blog lets users leave comments on articles. A visitor writes a comment containing *<script>alert('Hacked!');</script>*. When others view the page, the script runs and shows the alert. In some cases, it also steals login session cookies. Story 2: A hospital's patient portal allows users to search for patient records by entering a patient ID. A user discovers that entering special characters instead of a patient ID, like *101'; DROP TABLE patients;--*, causes the system to crash and deletes all patient data in the database. Read the two stories, and **identify** the software vulnerability mentioned in the scenario and **explain** these briefly.	5	**CLO-3** ***C4***
	b)	A hospital launches a secure telemedicine platform for patient-doctor consultations. Patient records are stored and sent in a safe format that only authorized doctors can read. Only verified users can access the system, and even if someone intercepts the data, it stays safe and untampered. This technology transformed information in a way that, ideally, only authorized parties can decode. **Identify** the technology mentioned in the scenario step by step and **explain** it with proper explanation with appropriate diagram.	5	