



Daffodil International University  
Faculty of Science & Information Technology  
Department of Computer Science & Engineering  
Final Semester Examination, Fall 2024  
Course Code: CSE233, Course Title: Embedded Systems and IoT  
Level: 3 Term: 2 Batch: 62

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)	Illustrate any wireless module used in an IoT system.	[2]	CO1
	b)	Distinguish BJT and MOSFET with proper application.	[2]	
	c)	Explain RISC and CISC with proper application.	[2]	
	d)	Describe the interrupt controller in the microcontroller unit.	[2]	
	e)	Recall the main differences between Von Neumann and Harvard architecture.	[2]	
2.	a)	Differentiate STM32 microcontroller from 8051 unit in terms of interfacing sensors, actuators or other networks.	[4]	CO2
	b)	Develop an embedded C program for an Automatic Pet Feeder using an Arduino and a servo motor. The servo must open a flap for 5 seconds to dispense food, then close it. Demonstrate understanding of system requirements through accurate implementation.	[5]	
3.	a)	For a microcontroller-based project, which type of Flash memory would you prefer among PROM, EPROM, and EEPROM? Justify your choice based on the specific needs and requirements of the project.	[4]	CO3
	b)	Demonstrate the process of developing a warehouse monitoring system that utilizes I2C to interface with sensors (such as temperature and humidity sensors) and SPI to control actuators (like fans and lights). Provide a comprehensive list of components required for the system and present a detailed design for implementation.	[5]	
4.	a)	Construct a general block diagram of the Cortex-M processor core and explain the fundamental components of it.	[5]	CO4
	b)	Design a smart city environmental monitoring system tailored for Daffodil Smart City using an STM32 microcontroller. The system should measure air quality, noise levels, and weather conditions. Implement LoRa WAN for long-range communication, Ethernet for high-speed data upload, and Bluetooth for on-site maintenance. Provide a detailed system schematic, block diagram with proper explanation.	[7]	