Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Fall 2025
Course Code:CSE317 ,Course Title:Microprocessor and Micro-controller
Level: 3 Term:1 Batch: 65

Time: 02:00 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)***	You are working with an STM32 microcontroller running an RTOS (Real-Time Operating System). The micro-controller controls a traffic light system via GPIO pins. i.**Explain** how the RTOS scheduler does the job to run simultaneously without interfering with each other with an example. ii.**Describe** the GPIO pin Configuration of STM 32 micro-controller	**[5]**	**CO2**
	b)	A micro-controller is used in a simple LED blinking circuit.The micro-controller turns the LED ON and OFF at a fixed interval using a timer.**Illustrate** how the micro-controller components interpretes to complete this task.	**[5]**	
	c)	**Explain** how a microcontroller handles interrupts,including the role of vector tables.Compare Von Neumann and Harvard architectures. Which architecture is commonly used in microcontrollers and why?	**[5]**	
3.	***a)***	**1**.You are writing a simple program to hide a secret message in memory. You have a 10-character space in memory where you want to: Fill all 10 spots with '*' characters (to hide any old data) Write your name "ALI" at the beginning Starting Memory ? ? ? ? ? ? ? ? ? ? After Step 1 (fill with '*'): * * * * * * * * * * Step 2 A L I * * * * * * *	**[3+3]**	**CO3**
		2. Use string instructions to find the first character 'c' from the string "microprocessor" and the position.		

	b)	Write an 8086 assembly program that: Pushes five ASCII characters (for example, 'H', 'E', 'L', 'L', 'O') onto the stack Pops and displays the characters on the screen in reverse order (so the output should be "OLLEH"). Use stack instructions (PUSH, POP) and DOS interrupt INT 21h for display. Do not use loops — manually handle the pushes and pops for this exercise.	**[4]**	**C O3**

	c)	. CODE
		MAIN PROC
		MOV AX, @DATA
		MOV DS, AX
		MOV AX, FFFFh
		ADD AL, 1
		MOV BX,B9F6h
		SUB BH, 2
		DEC AL
		XCHG AX, BX
		Apply the flag instruction concepts to find changes for all the instructions where flag bit will be effected and calculate the flag its.
			[5]	

3		A security module stores 8 status flags in AL = 1100 1101.**Analyze** the results by using Logic,Shift,Rotation instructions . AL=D7 D6 D5 D4 D3 D2 D1 D0 D7:CCTV active ; D6:Laser fence ON; D5:Siren ON; D4:Motion detected; D3:Tamper alert; D2:Backup battery ON; D1:Night mode; D0:Fire detected a.Check whether fire detected is active. b.Turn OFF the motion detected bit . c.Rotate the register left by 3 bits. d.After rotation, clear CCTV without direct masking . e.Extract the top 2 bits after rotation (D7-D6)	**[10]**	**C O4**