

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Fifth Semester

Computer and Communication Engineering

(Common to Electronics and Communication Engineering)

20ECPC402 - MICROCONTROLLERS AND EMBEDDED SYSTEMS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

	Marks	K- Level	CO
1. Which of the following interrupt of 8086 has lowest priority? (a) Vectored Interrupt (b) Single Step (c) Int (d) RST 5.5	1	K1	CO1
2. The instruction 'MOV AX, 40H[BX]' is an example of _____ addressing mode of 8086. (a) Immediate (b) Direct (c) Register Relative (d) Indexed	1	K1	CO1
3. Give the full form of PSEN in 8051. (a) Program Status Enable (b) Program Store Enable (c) Program Status End (d) Program Status Disable	1	K1	CO2
4. In the 8051 microcontroller _____ will act as standard UART mode. (a) Mode 2 (b) Mode 0 (c) Mode 1 (d) Mode 3	1	K1	CO2
5. Which of the following is not a type of I/O communication interface? (a) Parallel (b) Serial (c) Analog (d) Wireless	1	K1	CO3
6. A Timer is used in a microcontroller to: (a) Convert analog signals (b) Transfer data without CPU intervention (c) Generate precise time delays (d) Control external interrupts	1	K1	CO3
7. In a Traffic Light control system, a microcontroller controls the lights by sending signals to: (a) A D/A converter (b) The microcontroller's internal memory (c) Output ports connected to the LEDs (d) The interrupt controller	1	K1	CO4
8. What kind of display is typically used for a simple numeric counter, such as a token number display? (a) LCD display (b) LED display (c) CRT display (d) Keyboard display interface	1	K1	CO4
9. Which of the following can be used to refer to entities with n the RTOS? (a) Threads (b) kernels (c) System (d) Applications	1	K1	CO5
10. What is the processor used by ARM-7? (a) 8-bitCISC (b) 8-bitRICS (c) 32-bitCISC (d) 32-bit RICS	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11. Name the registers available in 8086.	2	K2	CO1
12. Draw the flag register of the 8086.	2	K2	CO1
13. Write an 8051 assembly language program to clear the accumulator and add 3 to the accumulator 10 times.	2	K2	CO2
14. What is the function of the DPTR register in 8051?	2	K1	CO2
15. List the functions performed by 8279.	2	K2	CO3
16. What is the use of Vref pin in the ADC?	2	K1	CO3
17. List the steps involved in converting an analog signal to a digital one using an A/D interface.	2	K2	CO4
18. What is the role of the alarm controller in a fire detection system?	2	K1	CO4

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| 19. Define round robin scheduling. | 2 | K2 | CO5 |
| 20. What is meant by embedded system? | 2 | K1 | CO5 |
| 21. Name five peripherals in the LPC2148 MCU. | 2 | K2 | CO6 |
| 22. Distinguish between single and double edge PWM. | 2 | K2 | CO6 |

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

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| 23. a) Explain in detail about the 8086 instruction set. | 11 | K2 | CO1 |
| OR | | | |
| b) Illustrate the architecture of 8086 Microprocessor with neat diagram. | 11 | K2 | CO1 |
| 24. a) Describe the addressing modes of 8051 Microcontroller with suitable example. | 11 | K2 | CO2 |
| OR | | | |
| b) Illustrate the architecture of 8051 Microcontroller with neat diagram. | 11 | K2 | CO2 |
| 25. a) Draw the block diagram of 8279 and explain the function of each block. | 11 | K2 | CO3 |
| OR | | | |
| b) Explain the block diagram, description and function of 8251. | 11 | K2 | CO3 |
| 26. a) Design and explain a programming solution for a simple LED display to show numbers from 0 to 9 in a continuous loop. | 11 | K3 | CO4 |
| OR | | | |
| b) Develop a programming logic for an Alarm Controller that uses a keypad to set a 4-digit password and a buzzer to sound an alarm if the wrong password is entered three times. | 11 | K3 | CO4 |
| 27. a) Describe in detail about the design of model train controller. | 11 | K2 | CO5 |
| OR | | | |
| b) Explain task scheduling algorithm in embedded real time system. | 11 | K2 | CO5 |
| 28. a) Outline the working of a UART in LPC214x in detail. | 11 | K2 | CO6 |
| OR | | | |
| b) Explain the Instruction set of the ARM processor with examples in detail. | 11 | K2 | CO6 |