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Question Paper Code: R4I02

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Fourth Semester

R21UIO402- MICROPROCESSOR AND EMBEDDED SYSTEMS

CSE (Internet of things)

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is the purpose of CLK signal in an 8086 system? CO1- U
2. The value of Code Segment (CS) Register is 4042H and the value of different offsets is as follows: BX: 2025H , IP: 0580H , DI: 4247H Calculate the effective address of the memory location pointed by the CS register. CO2-App
3. Define Multiplexer. CO1- U
4. List the functions performed by 8279. CO1- U
5. What is the purpose of using instruction register? CO1- U
6. What is data pointer (DTPR)? CO1- U
7. How is the 8051 serial port different from other micro controllers? CO1- U
8. Write a program to find the 2's complement using 8051? CO2-App
9. What is operational quality attributes? Provide two examples. CO1- U
10. What is hardware/software co-design? CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Give three examples for the following 8086 microprocessor instructions: String Instructions, Process Control Instruction, Program Execution Transfer Instructions and Bit manipulation Instructions. CO2- App (16)
- Or
- (b) Write an 8086-assembly language program to subtract two 16-bit numbers. CO2- App (16)

12. (a) Describe the block diagram of 8259 Programmable Interrupt Controller and its priority modes. CO1- U (16)
- Or
- (b) Draw the block diagram of 8279 keyboard/ Display controller and explain how to interface the Hex Key pad and 7- segment LEDs using 8279. CO1- U (16)
13. (a) In the 8051, what is the role of the accumulator (A) in various addressing modes? CO1- U (16)
- Or
- (b) Draw and explain the Input / Output lines of 8051 in detail. CO1- U (16)
14. (a) With a neat circuit diagram explain how a 4x4 keypad is interfaced with 8051 microcontroller. CO2- App (16)
- Or
- (b) How would you interface a stepper motor with a microcontroller (e.g., 8051) to control its movement by using Darlington pair and 7407 registers? CO2- App (16)
15. (a) Write Embedded c program to display "hello world" by interfacing LCD display to 8051 microcontroller. CO2- App (16)
- Or
- (b) Write Embedded C program by using timer mode 1 to make the LED blink using polling method. Assume XTAL frequency 11.059 MHZ. CO2- App (16)