

Reg. No.

Question Paper Code

13242

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Fifth Semester

Electrical and Electronics Engineering

20EEPC503 - MICROPROCESSORS AND MICROCONTROLLERS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

Marks K-Level CO

1. The accumulator in the 8085 is a/an ____ bit register. 1 K1 CO1
(a) 8 (b) 16 (c) 32 (d) 64
2. During the execution of an instruction in 8085, the machine cycle starts with which operation? 1 K1 CO1
(a) Opcode Fetch (b) Memory Read (c) Memory Write (d) I/O Read
3. In a typical memory read cycle of the 8085, how many clock cycles are required? 1 K1 CO1
(a) 1 clock cycle (b) 2 clock cycles (c) 3 clock cycles (d) 4 clock cycles
4. The registers used to store address of the next instruction to be executed is called 1 K1 CO1
(a) Flags (b) Address register (c) Program counter (d) Accumulator
5. Which of the following is a 3-byte instruction in 8085? 1 K1 CO2
(a) MOV A, B (b) JMP 2050H (c) CPI 32H (d) ANI 0FH
6. What is the function of the instruction CPI 45H in the 8085? 1 K1 CO2
(a) Compares the accumulator with 45H (b) Adds 45H to the accumulator
(c) Subtracts 45H from the accumulator (d) Loads 45H into the accumulator
7. Which of the following is a control instruction in the 8085? 1 K1 CO2
(a) STA (b) HLT (c) MOV (d) MVI
8. The instruction XCHG in the 8085 microprocessor exchanges data between which registers? 1 K1 CO2
(a) A and B (b) A and H (c) HL and DE (d) BC and DE
9. In the 8254 timer, Mode 3 is also known as: 1 K1 CO3
(a) Interrupt on Terminal Count (b) Rate Generator
(c) Square Wave Generator (d) Software Triggered Strobe
10. ____ Stores the bits required to mask the interrupt input. 1 K1 CO3
(a) IRR (b) ISR (c) IMR (d) NMI
11. The 8-bit ____ data buffer interfaces internal circuit of 8253 to microprocessor systems bus 1 K1 CO3
(a) Unidirectional (b) Single (c) Bidirectional (d) None of these
12. In which of the following modes is the 8255 PPI capable of transferring data while handshaking with the interfaced device? 1 K1 CO3
(a) BSR mode (b) Mode 0 of I/O mode (c) Mode 1 of I/O mode (d) Mode 2 of I/O mode
13. Which of the following ports can be used as both input and output in the 8051? 1 K1 CO4
(a) Port 0 (b) Port 1 (c) Port 2 (d) All of the above
14. The matrix keypad in the 8051 consists of 1 K1 CO4
(a) Rows and columns of switches (b) Rows of resistors
(c) Digital display LEDs (d) Analog inputs
15. Which of the following has the highest priority in the 8051 interrupt system? 1 K1 CO4
(a) External Interrupt 0 (b) Timer 1 interrupt
(c) Serial communication interrupt (d) Reset
16. Which bit is used to start or stop Timer 0 in the 8051? 1 K1 CO4
(a) TR0 (b) TF0 (c) IE0 (d) TMOD

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|--|---|----|-----|
| 17. Which of the following is a typical use case for ARM Cortex-M0 processors? | 1 | K1 | CO5 |
| (a) Internet of Things (IoT) devices | | | |
| (b) High-performance servers | | | |
| (c) Desktop PCs | | | |
| (d) Supercomputers | | | |
| 18. Which tool is typically used to compile source code for the ARM Cortex-M0? | 1 | K1 | CO5 |
| (a) GCC ARM Compiler | | | |
| (b) Keil uVision | | | |
| (c) IAR Embedded Workbench | | | |
| (d) All of the above | | | |
| 19. The "endian" used by the ARM Cortex-M0 can be configured as: | 1 | K1 | CO5 |
| (a) Big-endian only | | | |
| (b) Little-endian only | | | |
| (c) Either big-endian or little-endian | | | |
| (d) None of the above | | | |
| 20. The Cortex-M0 microcontroller uses which of the following to interface with external memory and peripherals? | 1 | K1 | CO5 |
| (a) APB (Advanced Peripheral Bus) | | | |
| (b) AHB (Advanced High-performance Bus) | | | |
| (c) AMBA (Advanced Microcontroller Bus Architecture) | | | |
| (d) AXI (Advanced eXtensible Interface) | | | |

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

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|---|---|----|-----|
| 21. Show the function of the signal IO/M, S0, S1. | 2 | K1 | CO1 |
| 22. Outline Program counter in 8085 mp. | 2 | K2 | CO1 |
| 23. If the clock frequency is 5 MHz, show the time required to execute an instruction having 18 T-states. | 2 | K2 | CO2 |
| 24. Relate the similarity and difference between compare and subtract instructions. | 2 | K2 | CO2 |
| 25. What is the need for 8259 PIC? | 2 | K1 | CO3 |
| 26. Compare the two key lockout and N-key rollover modes in 8279. | 2 | K2 | CO3 |
| 27. List the interrupts of 8051 microcontroller. | 2 | K1 | CO4 |
| 28. Illustrate the function of Program Status Word in microcontrollers. | 2 | K2 | CO4 |
| 29. What is M0 ARM cortex? | 2 | K1 | CO5 |
| 30. List some applications of ARM cortex. | 2 | K1 | CO5 |

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

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| 31. a) Explain with a neat block diagram the architecture of 8085 microprocessor. | 10 | K2 | CO1 |
| OR | | | |
| b) Outline the timing diagram for memory read and write operations and explain. | 10 | K2 | CO1 |
| 32. a) Identify the various addressing modes of 8085 microprocessor with suitable example. | 10 | K3 | CO2 |
| OR | | | |
| b) Develop an ALP of 8085 microprocessor to add 16 bit data stored in memory from 9200H. | 10 | K3 | CO2 |
| 33. a) Explain the architecture, functions and modes of the 8255 PPI. | 10 | K2 | CO3 |
| OR | | | |
| b) Discuss briefly the block diagram of 8254 timer. | 10 | K2 | CO3 |
| 34. a) Explain with a neat block diagram the architecture of 8051 microcontroller. | 10 | K2 | CO4 |

OR

- b) Explain the stepper motor control using 8051 and write an assembly language program for running the stepper motor in clockwise direction. 10 K2 CO4
35. a) Discuss in detail about programming model of ARM M0 cortex. 10 K2 CO5
- OR**
- b) Show ARM Development flow with help of a diagram. 10 K2 CO5
36. a) i) Summarize the addressing modes of 8051 microcontroller with suitable examples. 5 K2 CO4
- ii) Explain the concept of ARM cortex M0. 5 K2 CO5
- OR**
- b) i) Explain the following instructions of 8051 micro-controller 5 K2 CO4
1. DJNZ Ro, HERE
 2. CJNZ @ Ri, #data, rel
- ii) Summarize the evolution and main trends of the microcontroller market until the appearance of ARM Cortex core micro controllers. 5 K2 CO5