| Reg. No. | | | | | | | | | | | | | | | | |
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| Question Paper Code | 14694 |
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026**

Fifth Semester

**Electrical and Electronics Engineering**

**20EEPC503 - MICROPROCESSORS AND MICROCONTROLLERS**

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

**PART – A (i) (MCQ)**
**(16 × 1 = 16 Marks)**
Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 1. | How many general-purpose registers are there in 8085?<br>a) 4 b) 5<br>c) 6 d) 7 | 1 | K1 | CO1 |
| 2. | Infer the flag which is set if the result of an operation is zero.<br>a) Carry flag b) Zero flag<br>c) Sign flag d) Parity flag | 1 | K2 | CO1 |
| 3. | During opcode fetch cycle, which operation is performed first?<br>a) Execute instruction b) Decode instruction<br>c) Fetch opcode from memory d) Store result | 1 | K3 | CO1 |
| 4. | The instruction LDA 2050H uses:<br>a) Register addressing b) Immediate addressing<br>c) Direct addressing d) Indirect addressing | 1 | K1 | CO2 |
| 5. | What is the function of the HLT instruction?<br>a) Restart program b) Halt the processor<br>c) Reset memory d) Jump to address | 1 | K2 | CO2 |
| 6. | In a loop structure, which instruction is commonly used for conditional branching?<br>a) MOV b) ADD<br>c) JNZ d) PUSH | 1 | K3 | CO2 |
| 7. | The 8255 is a<br>a) Timer b) Interrupt controller<br>c) Programmable Peripheral Interface d) Keyboard controller | 1 | K1 | CO3 |
| 8. | What is the main function of 8279?<br>a) Interrupt handling b) Keyboard and display control<br>c) Memory interfacing d) Arithmetic operations | 1 | K2 | CO3 |
| 9. | For generating accurate time delays in 8085, which IC is most suitable?<br>a) 8259 b) 8279<br>c) 8255 d) 8254 | 1 | K3 | CO3 |
| 10. | The 8051 has how many timers?<br>a) 4 b) 3<br>c) 2 d) 1 | 1 | K1 | CO4 |
| 11. | Which interrupt has the highest priority by default?<br>a) Timer 1 b) External Interrupt 0<br>c) Serial Interrupt d) Timer 0 | 1 | K2 | CO4 |

| | | | | | |
|---|---|---|---|---|---|
| 12. | For stepper motor control, which port is typically used? | | *1* | *K3* | *CO4* |
| | a) Port 0 | b) Port 1 | | | |
| | c) Port 1 | d) Any Port | | | |
| 13. | ARM Cortex-M0 is based on which architecture? | | *1* | *K1* | *CO5* |
| | a) CISC | b) RISC | | | |
| | c) VLIW | d) Harvard | | | |
| 14. | The Program Counter (PC) is also known as: | | *1* | *K1* | *CO5* |
| | a) R13 | b) R14 | | | |
| | c) R15 | d) R12 | | | |
| 15. | What happens during microcontroller start-up sequence? | | *1* | *K2* | *CO5* |
| | a) Program execution stops | b) Registers are cleared and execution begins from reset vector | | | |
| | c) Memory is deleted | d) Interrupts are disabled permanently | | | |
| 16. | During I/O operations, data transfer occurs through: | | *1* | *K3* | *CO5* |
| | a) Registers only | b) Memory only | | | |
| | c) Peripheral interfaces | d) ALU | | | |

**PART – A (ii) (Short Answer Questions)**
**(8 × 3 = 24 Marks)**
Answer ALL Questions

| | | | | |
|---|---|---|---|---|
| 17. | Identify the role of timing and control unit in 8085 Microprocessor. | *3* | *K3* | *CO1* |
| 18. | Categorize the role of different flags in decision-making operations. | *3* | *K4* | *CO1* |
| 19. | Illustrate register addressing mode using a suitable instruction. | *3* | *K3* | *CO2* |
| 20. | Distinguish between conditional and unconditional branching instruction. | *3* | *K4* | *CO2* |
| 21. | Model the timer operation for delay generation. | *3* | *K3* | *CO3* |
| 22. | Develop an I/O port configuration to interface external devices with a microcontroller. | *3* | *K3* | *CO4* |
| 23. | Apply serial communication concepts for data transmission. | *3* | *K3* | *CO4* |
| 24. | Analyze the register organization of the Cortex-M0 processor. | *3* | *K4* | *CO5* |

**PART - B (Descriptive Answer Questions)**
**(5 × 12 = 60 Marks)**
Answer ALL Questions

| | | | | | |
|---|---|---|---|---|---|
| 25. | a) | Sketch the block diagram of 8085 microprocessor, and organize the function of each unit in executing an instruction. | *12* | *K3* | *CO1* |
| | | **OR** | | | |
| | b) | Construct timing diagrams illustrating the opcode fetch cycle and the memory read cycle. | *12* | *K3* | *CO1* |
| 26. | a) | Analyze the classification of instructions in 8085 and examine their functional differences. | *12* | *K4* | *CO2* |
| | | **OR** | | | |
| | b) | Examine the role of the stack in handling subroutine calls and returns with neat diagrams. | *12* | *K4* | *CO2* |
| 27. | a) | Design an interface between the 8255 and 8085, by utilizing various modes of operation of 8255. | *12* | *K3* | *CO3* |
| | | **OR** | | | |

| | | | | | |
|---|---|---|---|---|---|
| | b) | With neat diagrams, develop the interfacing of ADC/DAC with a microprocessor for signal conversion. | *12* | *K3* | *CO3* |
| 28. | a) | Model the structure of 8051 microcontroller and examine the operation of various I/O ports. | *12* | *K3* | *CO4* |
| | | **OR** | | | |
| | b) | Design a system to interface a keyboard and display unit with a microcontroller. | *12* | *K3* | *CO4* |
| 29. | a) | Analyze the architecture of Cortex-M0 and examine its register organization. | *12* | *K4* | *CO5* |
| | | **OR** | | | |
| | b) | Analyze the flow of data from input to output during system development. | *12* | *K4* | *CO5* |