

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fourth Semester B.E. Degree Examinations, July 2026

8051 MICROCONTROLLER

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO: PI)</u>
<u>Module-1</u>			
1.	a. Describe the block diagram of the 8051 in detail.	10	(2 : 1 : 1.3.1)
	b. Explain the memory organization of 8051 with a neat diagram.	10	(2 : 1 : 1.3.1)
(OR)			
2.	a. Differentiate between a microcontroller and a microprocessor.	08	(2 : 1 : 1.3.1)
	b. Define embedded systems. List the applications of embedded systems.	04	(2 : 1 : 1.3.1)
	c. Explain the Program Status Word (PSW) register with examples.	08	(2 : 1 : 1.3.1)
<u>Module-2</u>			
3.	a. Explain the different types of instructions based on opcode with examples.	10	(2 : 2: 1.3.1)
	b. Explain different types of logical Instructions with examples.	10	(2 : 2: 1.3.1)
(OR)			
4.	a. Explain with examples the operation performed by the following instructions. (i) MOVX @DPTR, A (ii) MOVC A, @A+DPTR (iii) DA A (iv) XCH A @R0 (v) ANL A,20h (vi) SUBB A, @R1	08	(3: 2: 1.3.1)
	b. Explain shift and rotate instructions with examples.	04	(2 : 2: 1.3.1)
	c. Analyze each of the following instructions and write down the contents of registers and memory locations after executing the following instructions. MOV R0, #40h MOV 41h, #33h MOV A, #22h MOV @R0, A INC R0 MOV A, @R0	08	(3 : 5: 1.3.1)
<u>Module-3</u>			
5.	a. Explain PUSH and POP instructions with the help of an example program.	06	(2 : 3: 1.3.1)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

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| b. | Write an 8051 program to transfer an 8-byte block of data from the source memory location at address 2000h to the destination memory location whose address starts at 40h. | 10 | (3 : 3: 1.3.1) |
| c. | Differentiate between JUMP and CALL instructions. | 04 | (2 : 3: 1.3.1) |

(OR)

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| 6. | a. | Explain the subroutine instruction with an example. | 06 | (2 : 3: 1.3.1) |
| | b. | Write an 8051-assembly program to perform the addition of two 16-bit numbers stored at memory locations 20h, 21h, 22h, 23h and store the result at 24h and 25h memory locations. | 08 | (3 : 3: 1.3.1) |
| | c. | Explain the steps involved when a CALL instruction is executed. | 06 | (2 : 3: 1.3.1) |

Module-4

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| 7. | a. | Write an 8051 program to generate a square wave with 5 KHz on all pins of Port 0. System Clock is 22 MHz. Use timer0 in Mode-1. | 10 | (3 : 4: 1.3.1) |
| | b. | Explain the TMOD and TCON registers in detail. | 10 | (2 : 4: 1.3.1) |

(OR)

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| 8. | a. | Explain the bit status of the SCON register. | 05 | (2 : 4: 1.3.1) |
| | b. | Write a program for the 8051 to transfer “BITM ECE” serially at 9600 baud, 8-bit data, 1 stop bit, and do this continuously. | 10 | (3 : 4: 1.3.1) |
| | c. | Explain simplex, half-duplex, and full-duplex transfer. | 05 | (2 : 4: 1.3.1) |

Module-5

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| 9. | a. | What is an Interrupt? List the various interrupts of 8051 with their corresponding vector address. | 10 | (2 : 5: 1.3.1) |
| | b. | Explain the IP and IE registers in detail. | 10 | (2 : 5: 1.3.1) |

(OR)

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| 10. | a. | Draw the block diagram to show how the 8051 is connected to the DAC 0808 at port P1. | 06 | (2 : 5: 1.3.1) |
| | b. | Write a 8051 program to generate a sine wave using a DAC. | 08 | (3 : 5: 1.3.1) |
| | c. | Explain the Internal architecture of ADC 0804. | 06 | (2 : 5: 1.3.1) |

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