

Ca/D/TY

Reg. No: _____



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of the UGC Act, 1956)

Final Assessment Test - April 2025

Course: BECE204L - Microprocessors and Microcontrollers

Class NBR(s): 2421 / 2423 / 2424 / 2425 / 2426

Slot: D2+TD2

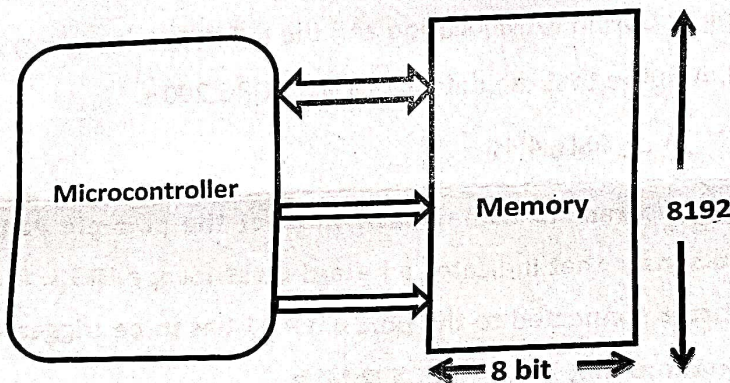
Max. Marks: 100

Time: Three Hours

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions
(10 X 10 = 100 Marks)

1. (i) Explain why microcontrollers are preferred over microprocessors for small to medium appliance applications.
- (ii) Identify the following buses given in the diagram. Also, calculate the size of address bus, data bus and the number of bits to be stored in the given memory.



2. Explain with suitable diagram the bus interface and execution unit of 8086 microprocessor.
3. Write an assembly language program to add two 8 bit data. Assume the data as 3EH and 4DH. The first data is in register R0 of bank0 and second data is in register R1 of bank 1. The result should be stored in register R2 of bank 2. Show the status of flags after the addition operation for the above data. Based on the status of each flag(set or reset) store the bit, in bit addressable RAM as follows,

Flags	Bit address(H)
Carry	7F
Aux.carry ✓	6F
Parity ✓	4F

- 4.(a) Write an 8051 assembly program to calculate y which is expressed as $y = x^3 + 9x + 7$ where x is assumed between 0 and 5 and the look-up table for x^3 has to be stored in code space from the location 300H onwards. Store x in register R0 and the final value of y in register R2.

OR

- 4.(b) Write an assembly language program using 8051 microcontroller instructions that finds the number is ODD or EVEN in a given data. Store the ODD data in memory location starting at 60H in RAM location and the EVEN data in memory location starting at 50H. Assume that the data is stored in ORG 200H.

DB 08H, 81H, AFH, 4EH, 68H, 4FH

5. Write an 8051-assembly program to continuously monitor the port pin P1.0 which is connected to a sensor that indicates a hazard by sending a HIGH. If a hazard is detected, a buzzer connected to the port pin P1.1 has to be triggered for 500 microseconds. Assume that XTAL = 11.0592 MHz.

- 6.(a) Write an assembly language program to read port P0 and transmit serially out by giving a copy to P2 do the operations simultaneously at the baud rate of 19200.

OR

- 6.(b) Write an 8051-assembly program that continuously gets 8-bit data from P1 and sends it to P2 while simultaneously creating a square wave of 1KHz on pin P0.1. Use Timer 1 to create the required delay for generating the square wave. Assume that XTAL = 11.0592 MHz.

7. Assume a seven segment LED display is connected in common-cathode configuration at Port1 of 8051 Microcontroller. Develop an ALP to display '0', '2', '4' with delay of 20 msec. Show the interfacing diagram.
8. Assume a switch is connected to P0.7. If SW=0, develop a program to generate a staircase waveform of 10 steps by interfacing DAC0808 with 8051 microcontroller else generate a staircase waveform with 5 steps.
9. Discuss about the dataflow model in an ARM7 with a neat sketch.
10. Explain the following instructions in ARM processor with suitable example.

(a) CMP (b) TEQ (c) B (d) BL (e) MLA

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