REG.NO.: 24BDE0139

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

**SCORE**

**CONTINUOUS ASSESSMENT TEST - 2**
**WINTER SEMESTER 2025-2026**

**SLOT: F2+TF2**

**Programme Name & Branch** : B.Tech Computer Science and Engineering (Artificial Intelligence and Data Engineering) & Computer Science and Engineering (Cyber Security)
**Course Code and Course Name** : BECE204L - Microprocessors and Microcontrollers
**Faculty Name(s)** : Dr.Karthikeyan A , Dr. Anis Fatema
**Class Number(s)** : VL2025260504431, VL2025260504421
**Date of Examination** : 22-03-2026
**Exam Duration** : 90 minutes **Maximum Marks: 50**

**General instruction(s): Open Text Book / Open Note Book**

- Answer All Questions
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
  CO 3. Comprehend the architectures and programming of 8051 microcontroller.
  CO 4. Deploy the implementation of various peripherals such as general purpose input/ output, timers, serial communication, LCD, keypad and ADC with 8051 microcontroller

| Q. No | Question | M | CO | BL |
|---|---|---|---|---|
| 1. | Develop an 8051 ALP to transmit a string 'AGNIICBM' continuously at the baud rate of 19200. Simultaneously a data communication must take place between P0 and P2. Also draw the format of special function registers and its configurations needed for this program. Comment every line of the program, do the necessary calculation, specify the output and explain . | 10 | 3 | 3 |
| 2. | Develop an 8051 ALP to use Counter 0 in mode 2 and after 20 numbers of counts on TL1, generate a SQUARE waveform of 2 KHz on P1.1 by using Timer 1 in mode 1, and show the counts in TL1 on port 2. Also draw the format of special function registers needed for this program and estimate the necessary configuration values of the registers. Comment every line of the program, do the necessary calculation, specify the output | 10 | 3 | 3 |
| 3. | Analyse and rectify the errors for given program of 8051 program to get data from a single bit of P1.2 and send it to P1.5 continuously while an interrupt will do the following serial interrupt service routine to receive data from a PC and display it on P2 port. The baud rate is at 9600. Draw the format of special function registers needed for this program and Comment every line of the program by explaining the register configurations and specify the output. Assume XTAL = 11.0592 MHz<br>ORG 0000H<br>LJMP MAIN<br>ORG 0026 H<br>LJMP SERIAL<br>ORG 0030H<br>MAIN:SETB P1.2 ;<br>MOV TMOD,#20H ;<br>MOV TH1,# 3<br>MOV SCON ,#50H ; | 10 | 3 | 3 |

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| | | | | |
|---|---|---|---|---|
| | MOV IB,#100100000B ;<br>SETB TR1<br>BACK:MOV C,P1.2<br>MOV P1.5,C<br>SJMP BACK<br>SERIAL:JB TI,TRANS<br>MOV SBUF,P2<br>RET<br>TRANS:CLR TI<br>RET<br>END | | | |
| 4. | Interface Digital Temperature Monitoring and Alarm System using the ADC0804 interfaced with the Intel 8051. An LM35 temperature sensor provides an analog output of 10 mV/°C (0–1.5 V for 0–150°C) which is connected to the input of the ADC0804.<br>Draw a circuit diagram for the given system ,interfacing ADC0804 with the 8051 Data lines (D0–D7) connected to Port 1 , CS connected to P3.6 ,WR connected to P3.7, RD connected to P3.5, INTR connected to P3.2 and Write an 8051 Assembly program to Start ADC conversion, Wait for end-of-conversion (INTR),Read the digital data, convert the ADC value into temperature in °C and Output the temperature on Port 2. If the measured temperature exceeds 50°C then Turn ON a buzzer connected to P3.0, otherwise keep the buzzer OFF. Assume, Vref /2 = 2.5 V (ADC full scale = 5 V) and Resolution = 19.53 mV/step. | 10 | 4 | 3 |
| 5. | Discuss in detail about LCD interfacing with 8051 microcontroller and develop an 8051 assembly program for the below LCD display [2rows, 16 characters]. Assume "APJKALAM" is stored in ROM starting from 700H. Bring the characters that to be displayed in LCD from ROM location starting at 700H . Comment every line of the program by explaining the register configurations and specify the output. Assume XTAL = 11.0592 MHz<br><br>A P J K A L A M<br><br>**Reference:**<br>01 – clear display<br>38 – 2 lines 5X7 matrix<br>0E – Display ON cursor blinking<br>06 – Increment cursor<br>04 – Decrement cursor<br>80 – Force cursor to beginning of first line.<br>C0 - force cursor to beginning of Second line<br>18 Shift the entire display to the left<br>14 Shift cursor position to right<br>10 Shift cursor position to left<br>1C Shift the entire display to the right | 10 | 4 | 3 |

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