VIT®

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

Final Assessment Test(FAT) - NOV/DEC 2025

Programme	B.Tech.	Semester	Fall Semester 2025-26
Course Code	BECE204L	Faculty Name	Prof. Muthulakshmi S
Course Title	Microprocessors and Microcontrollers	Slot	D1+TD1
		Class Nbr	CH2025260100476
Time	3 hours	Max. Marks	100

Instructions To Candidates

- Write only your registration number in the designated box on the question paper. Writing anything elsewhere on the question paper will be considered a violation.

Course Outcomes

CO1: Comprehend the various microprocessor including Intel Pentium Processors.
CO2: Infer the architecture and programming of Intel 8086 microprocessor.
CO3: Comprehend the architecture and programming of 8051 microcontroller.
CO4: Deploy the implementation of various peripherals such as general purpose input/output, timers, serial communication, LCD, keypad, and ADC with 8051 microcntroller.
CO5: Infer the architecture pf ARM processor.
CO6: Develop the simple application using ARM processor.

Section - I
Answer all Questions (4 × 10 Marks)

01. a) For designing a battery operated, low cost, low power consuming handheld mixer-grinder, which is your choice of selection-microprocessor or microcontroller? Justify. [5 Marks].
b) Compare Von-Neumann and Harvard architecture with example. [5 Marks]

[10] (CO1/K2)

02. With neat sketch, explain the architecture of Programmable Peripheral Interface in detail.

[10] (CO2/K1)

03. Consider an array of ten 8-bit hexadecimal numbers stored in the offset memory location starting from 3000H as given below.
{10H, 14H, 15H, 45H, 24H, 36H, 48H, 50H, 96H, 77H} . Write an 8086 assembly language program to calculate X from the following equation and store the result in the offset memory location 4000H.
X= Sum of even numbers - Sum of odd numbers

[10] (CO2/K3)

04. a) Discuss the registers of ARM processor in detail.[5 Marks]
b) Explain the different modes of ARM processor in detail.[5 Marks]

[10] (CO5/K1)

Section - II
Answer all Questions (4 × 15 Marks)

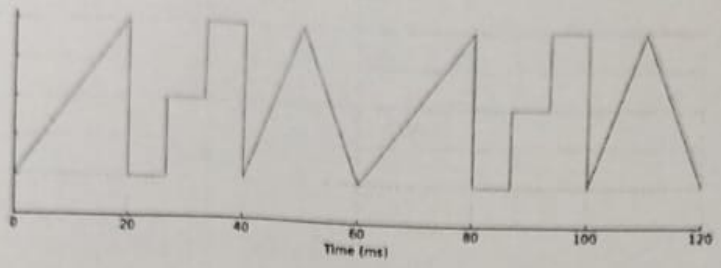
05. a) Draw the architecture of 8051 microcontroller and explain its functional block in detail. [8 Marks]
b) A weather monitoring station has stored the October month's rainfall of Chennai city starting from the memory location 40H. Write an 8051 assembly language program to calculate the number of days the rainfall has exceeded 10cm. Store the result in the register R7. Assume all the data are 8-bit hexadecimal. [7 Marks]

[15] (CO3/K1)

06. a) Write an 8051 assembly language program to transmit "Welcome to VIT" serially, continuously with the baud rate of 9600, 8-bit data, 1-stop bit. [8 Marks]
b) Write an 8051 assembly language program to generate a square wave of 2kHz on pin P1.0 using timer0 in mode1 using interrupt. Assume the crystal frequency as 11.0592MHz. [7 marks]

[15] (CO4/K3)

07. Write an 8051 assembly language program to generate the following waveform on P1.0. Consider the minimum amplitude as 0V and maximum as 5V.



[15] (CO4/K3)

08. a) In the table given below, fill the values of each register after the execution of every ARM instruction in the following single program. [8 Marks]

	r1	r2	r3	r4
Initial Values of Registers	0x00000005	0x00000003	0x00000003	0x00000003
ADD r4,r2,r3 LSL #1				
MLA r1,r2,r3,r4				
BIC r3,r2,r2				
CMP r3,r4				

b) Write an equivalent ARM assembly language program for the given piece of C code. [7 Marks]
if(a>5{x==5;y=c+d}else [x=c-d}

[15] (CO6/K4)

BL-Bloom's Taxonomy Levels - (K1-Remembering,K2-Understanding,K3-Applying,K4-Analysing,K5-Evaluating,K6-Creating)

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