



# VIT<sup>®</sup>

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

Reg. No. :

## Final Assessment Test(FAT) - Nov/Dec 2024

Programme	B.Tech.	Semester	Fall Semester 2024-25
Course Code	BECE204L	Faculty Name	Prof. Manoj Kumar R
Course Title	Microprocessors and Microcontrollers	Slot	D1+TD1
		Class Nbr	CH2024250100334
Time	3 hours	Max. Marks	100

### General Instructions

- Write only Register Number in the Question Paper where space is provided (right-side at the top) & do not write any other details.

### Course Outcomes

1. Comprehend the various microprocessors including Intel Pentium Processors
2. Infer the architecture and Programming of Intel 8086 Microprocessor.
3. Comprehend the architectures and programming of 8051 microcontroller.
4. Deploy the implementation of various peripherals such as general purpose input/output, timers, serial communication, LCD, keypad and ADC with 8051 microcontroller
5. Infer the architecture of ARM Processor
6. Develop the simple application using ARM processor.

### Section - I

Answer all Questions (2 × 10 Marks)

\*M - Marks

Q.No	Question	*M	CO	BL
01.	Discuss and highlight the pros and cons of using 8-bit and 16-bit microprocessors to design an automatic door locking system with neat block diagram. Justify the answer with respect to the memory, processing speed and architecture.	10	1	1
02.	Draw and explain different kinds of registers and modes of operation of ARM processor.	10	5	1

### Section - II

Answer all Questions (4 × 15 Marks)

\*M - Marks

Q.No	Question	*M	CO	BL
03.	(a) Write an 8051 ASM program to generate a square wave of 100Hz on P2.0. Generate a delay of 2 ms using loops and use the delay to generate square wave with the crystal frequency of 12 MHz. (10 marks)	15	3	3
	(b) Discuss the addressing modes of 8051 with examples. (5marks)			



04.	(a) Write an 8051 ASM program to generate a square wave with $T_{ON}$ of 3ms and $T_{OFF}$ of 10ms on all pins of port 0 using Timer 0 mode 1. Assume an XTAL of 22MHz. Clearly explain the delay calculation. (10 marks)  (b) Draw and explain the bits in following registers. (5 marks) i. TCON ii. SCON iii. PCON	15	4	3
05.	Explain the steps to program ADC 0804 and write an 8051 ASM program to interface 8051 with ADC 0804. Make P1 as input and resulting digital data should be displayed in the LCD as ASCII values. Use P2.0 = RD, P2.1=WR, P2.3=INTR for ADC0804 and P2.4 =RS, P2.5=R/W, P2.6= E for LCD control signals, P0.0 to P0.7 for LCD data pins.	15	4	4
06.	(a) For the following piece of c code write an equivalent ARM ASM program. (6 marks)  if (a < b) { x = 5; y = c + d; } else x = c - d;  (b) For the following logical equation write an equivalent ARM ASM program. (5 marks)  $z = (a \ll 2)   (b \& 15);$  (c) Write an ARM ASM program to find the average of five numbers and store the result in any general purpose register. (4 marks)	15	6	1

### Section - III

Answer all Questions (1 × 20 Marks)

\*M - Marks

Q.No	Question	*M	CO	BL
07.	(a) Write an 8086 ASM program to generate the Fibonacci series. Assume the length of sequence as 10. Store the data between 2000H to 2009H. (8 marks)  (b) Draw and explain the architecture of programmable interval timer. (6 marks)  (c) Draw and explain the following registers. (6 marks) i. 8255 I/O mode control word register ii. 8086 Flag register iii. 8253 control word register	20	2	1

BL-Bloom's Taxonomy Levels - (1.Remembering, 2.Understanding, 3.Applying, 4.Analysing, 5.Evaluating, 6.Creating)

