VIT
Vellore Institute of Technology

## Final Assessment Test (FAT) – May 2022

Programme	B.Tech		Semester	Winter Semester 2021-22
Course Title	MICROPROCESSOR AND INTERFACING		Course Code	CSE2006
Faculty Name	Prof. Chanthini Baskar		Slot	A2
			Class Nbr	CH2021225000510
Time	3 Hours		Max. Marks	100

PART A (5 X 12 Marks)
Answer All questions

1. With neat sketch, discuss the architecture of 8086. Also justify '8086 improves performance through pipelining' with proper example. [12 Marks] **[12]**

2. (i) Write 8086 assembly language program to find out first 10 elements of fibonacci series. Write the flow chart/algorithm also. [8 Marks] **[12]**

   (ii) Enunciate the importance of interrupts in microprocessor based system design. [4 Marks]

3. (i) Apply Port A of 8255 for transferring digital data output of ADC to the CPU and Port C for control signals. Assume that an analog input is present at the input2 of ADC and a clock input of suitable frequency is available for ADC. Write an 8086 assembly language program along with required algorithm by analysing the information from the interfacing diagram (Figure 1) below:- [8 Marks] **[12]**

   Figure 1
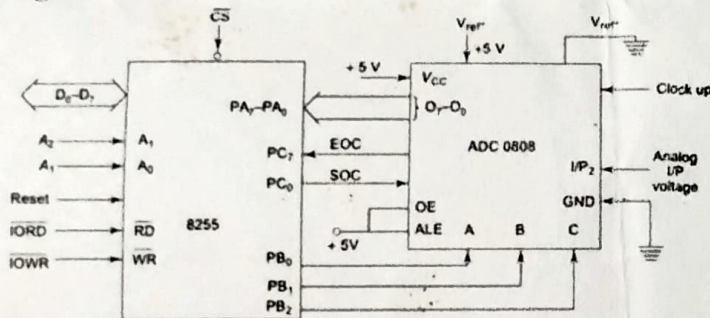
   (ii) Draw the mode instruction control word format for Asynchronous Transmission in 8251A USART? [4 Marks]

4. A brick measures 15 cm in length, 7.9 cm in breadth and 4.3 cm in height. Write an 8087 assembly language program to calculate the number of bricks will be used to make a wall of length 15 m, breadth 10 m and height 8 metres? Also validate your result with manual calculations. [12 Marks] **[12]**

5. (i) Design a smart irrigation system using Arduino, servo motor, soil moisture sensor, relay module and mini water pump. Use two soil moisture sensor to measure the moisture at different location. Program the Arduino to change the direction of water pump from one position to other location to avoid over watering in one location. (8 Marks) **[12]**

   (ii) Code an Arduino board to read a push-button connected to a digital input and turn on an LED connected to a digital output when the button is pressed. [4 Marks]

PART B (2 X 20 Marks)
Answer All questions

6. Consider a weather monitoring station where everyday temperature and pressure are logged as [20] shown in Table 1.Write an 8086 assembly language program to perform the following tasks:

(i) Find the highest temperature recorded.

(ii)Compute the average pressure and temperature recorded for the week.

Also, draw the program flowchart.

Table 1

Days	Temperature(in degrees)	Pressure(in Pa)
Monday	32	25
Tuesday	34	28
Wednesday	31	26
Thursday	33	29
Friday	30	23

7. (i)What are the different modes in which Timer 8253/8254 can work? Explain in detail with [20] functional block diagrams. [10 Marks]

(ii) Design a programmable timer using 8253/8254 and 8086. Interface the timer IC at an address 0082H, for counter 1. Write an ALP to interrupt the processor after 2 ms. 8086 runs at 5 MHz and the timer at 3 MHz. The 8254 is interfaced with lower order data bus (D_0 - D_7) & the A_0 and A_1 of the 8253/54 are connected with A_1 and A_2 of the processor. [10 Marks]