Name:.....
Roll No:.....

MAR ATHANASIUS COLLEGE OF ENGINEERING (AUTONOMOUS), KOTHAMANGALAM - 686666

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

B.TECH SECOND SERIES EXAMINATION, OCTOBER 2026 (S5 CS)

B24CS3T01 MICROPROCESSOR SYSTEMS

Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. **What** are software, hardware, and nested interrupts in the 8086 microprocessor? Briefly state one key characteristic of each. **(CO3)**
2. **T**wo interrupt requests occur while the 8086 is executing an instruction. **Explain** how the processor determines which interrupt is serviced first. **(CO3)**
3. **Explain** how a timer can be used to generate a fixed time delay in an STM32 application. **(CO4)**
4. **Explain** the role of the different layers in an IoT architecture. **(CO5)**

PART B

Answer all questions. Each question carries 14 marks.

5. **Design** an interface between the 8086 , two 8K $\times$ 8 RAM and two 8k $\times$ 8 ROM chips. Select a suitable address range and show the address decoding and connections to the lower and upper data buses. **(CO3)**(14 marks)
6. (a) **Explain** the working of a seven-segment display and describe how it can be interfaced with an STM32 microcontroller to display a specific digit at a time using HAL function.

   (CO4)(8 marks)

   (b) **Describe** the STM32 Integrated Development Environment (IDE) and the steps involved in creating and debugging a project. **(CO4)**(6 marks)

VISION

To mould competent computing professionals, innovators, and leaders guided by ethical values and committed to technological advancement and sustainable societal development.

MISSION

- Provide quality education through strong theoretical foundations, experiential learning, and exposure to emerging computing technologies.
- Cultivate critical thinking, research aptitude, and innovation through problem-based learning, industry interaction, and research initiatives.
- Foster ethical values, leadership, social responsibility, and an aspiration for lifelong learning through professional practices, teamwork, and mentoring.