



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

In Sem Examination-II Summer2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: ELE	Pattern: 2023
Name of Course: Microcontroller and Embedded Systems	Course Code: 2306216
Max. Marks: 30	Duration: 1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1 a) Differentiate between microprocessors and microcontrollers in terms of purpose, integration, Complexity, application, and performance. (7) CO 1

Question No. 2

- 2 a) In a smart traffic light system, sensors count the number of vehicles passing through an intersection. The data is sent in binary to the control unit, which performs the following operations: (8) CO 1
1. Converts binary data into decimal to display the count.
 2. Calculates the total vehicle count by summing the decimal values from multiple sensors.
 3. Converts the total count into hexadecimal for storage.

If the binary vehicle counts from three sensors are 110101, 100011, and 111010, calculate:

- a. The decimal count from each sensor.
- b. The total vehicle counts in decimal.
- c. The total count stored in hexadecimal format.

OR

- 2 b) In an industrial setup, pressure sensors send data to a control system in hexadecimal format for quick processing. The control system performs these tasks: (8) CO 1
1. Converts the hexadecimal data to binary for validation.
 2. Converts the binary data to decimal for visualization.
 3. Calculates the total pressure from all sensors in decimal.

If the pressure readings received are 0x3A, 0x4F, and 0x5B, calculate:

- a. The binary equivalent of each reading.
- b. The decimal equivalent of each reading.
- c. The total pressure in decimal.

Question No. 3

- 3 a) Draw a labelled pin diagram of the 8051 microcontrollers. Explain the functions of any five key pins in detail. (7) CO 2

Question No. 4

- 4 a) Write an 8051-assembly language program to convert a temperature value from Celsius to Fahrenheit. (8) CO 3

- Read the temperature from a sensor.
- Perform the conversion using the formula:
$$\text{Fahrenheit} = (\text{Data} \times 9/5) + 3$$

Display the result on an LCD.

OR

- 4 b) Write an 8051-assembly language program for a simple security system where: (8) CO 3

- A door lock is activated when a security pin code is entered.

Use logical operations to verify and control the door lock.

..... End of question paper.....