



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

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:III
Class: SY	Program:B.Tech
Branch Code: ETC	Pattern:2022
Name of Course: Embedded Systems	Course Code: ETC222002
Max. Marks:60	Duration:2.30 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 column indicates the Course Outcome of the Question/sub-question.

Question No. 1 Attempt following Question.

- 1a) Explain the waterfall model. State its merits and demerits. (6) CO1

Question No. 2 Attempt following Question

- 2a) Explain PSW register of 8051 (6) CO2

Question No. 3 Attempt following Question.

- 3a) Explain in depth Sourcing and Sinking interfacing concept of 8051 with LED. (8) CO3

OR

- 3b) Explain modes of operations of Timers available in 8051 and working of TMOD register. (8) CO3

- 3c) Write an embedded C program or assembly language program to work as hex counter using software delay and interface LEDS. (8) CO3

OR

- 3d) Write an embedded C program or assembly language program to turn on and turn off alternate LEDs of port P2 continuously every 50 ms. Use Timer 1, mode 1 to create delay. Draw interfacing diagram for the same. (8) CO3

Question No. 4 Attempt following Question.

- 4a) What is semaphore? Explain priority inversion problem using semaphore. (8) CO4

OR

- 4b) Explain general purpose OS with block diagram and how it is converted in embedded OS. (8) CO4
- 4c) Explain different states of Micro C/OS. (8) CO4

OR

- 4d) Explain foreground and background system with applications and compare them with RTOS. (8) CO4

Question No. 5 Attempt following Question.

- 5a) Draw an interfacing diagram of stepper motor and write an algorithm /flowchart to rotate clockwise continuously and for 90-degree rotation. (8) CO5

OR

- 5b) Draw the diagrammatic representation vending machine using 8051 microcontroller and write an algorithm /flowchart. (8) CO5

- 5c) Draw an interfacing diagram of dc motor control and write an algorithm /flowchart for the same. (8) CO5

OR

- 5d) Design(Interface DAC with 8051) a waveform generator and write an algorithm or flowchart to generate a triangular waveform. (8) CO5

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