

V/D/TY

Reg. No: 22BCE3005

Final Assessment Test - April 2025



VIT
Vellore Institute of Technology

Course: BCSE305L - Embedded Systems
Class NBR(s): 1430/1433/1437/1440/1444/1448/1452/
1457/1462/1466/1470/1475/1480/1485/1491/1498/
1503/1509/1515/1520/1526/1529/1533

Time: Three Hours

Slot: A2+TA2

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions
(10 X 10 = 100 Marks)

1. Compare and contrast desktop systems with an embedded systems and explain the architecture of 8051 microcontroller with neat sketch?
2. What is data acquisition system? With neat block diagram explain the characteristics, applications and working principle of the following data converters:
ADC-Analog to Digital Converter
DAC-Digital to analog converter
3. What is watch dog timer? Identify any 5 applications of timers and counters and discuss the operation of timers and counters with neat illustration of SFR's and write a program for the following : To generate a rectangular waveform of on time 5ms and off time 15ms and triangular waveform with a delay of 20ms. Assume timer 0, mode 1 with XTAL frequency of 11.059MHZ.
4. Design an embedded system namely washing machine and identify the necessary hardware and software components and discuss its working with pseudocode?
5. What is logic analyser? Explain the program analysis by drawing the DFG or CDFG for the following control structures with an example to each?
(1) If () (2)While () (3) Switch () (4) for ()
6. Compare and contrast RMS and EDF? Schedule the following task table using RMS and EDF?

Task	Period	Execution Time
P1	4	1
P2	6	3
P3	5	1

7. Compare and contrast I2C from CAN Bus? Explain the architecture of I2C Bus with neat Sketch?

8. Mention the different types of sensors and their characteristics. Discuss the role of embedded system in the following applications with neat interface diagram: agriculture and industrial control.

- 9.a) i. Identify and explain the various phases involved in translation of a program from source file to hex file for an embedded system with neat sketch? [5]
- ii. Write an 8051 C program to toggle only pin P2.5 continuously every 270msec. Use timer 0, mode2 to create the delay? [5]

OR

9.b) Describe the following embedded networking protocols?

- i. Bluetooth [5]
- ii. ZigBee [5]

10.a) How assembly language program is different from high level Language? Discuss in detail about the program or code optimization techniques with an example to each?

OR

10.b) Write short notes on the following?

- i. ARM Processor Programmers model [5]
- ii. PIC microcontroller [5]

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