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Sixth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Embedded Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Embedded systems. Explain the main components of an embedded system. (10 Marks)
 b. Give classification of embedded system. List the skills required to design small scale, medium scale and sophisticated embedded system. (10 Marks)

OR

- 2 a. With the help of neat timing diagram, explain the sequence of events that occur when microprocessor reads from ROM. (06 Marks)
 b. With neat block diagram, explain the expanded mode of operation of 68HC11 microcontroller. (08 Marks)
 c. Explain various registers of,
 (i) 6808 microcontroller.
 (ii) 6811 microcontroller. (06 Marks)
 (iii)

Module-2

- 3 a. With neat diagram, explain the operation of a 3 bit DAC with R-2R ladder network. (06 Marks)
 b. Explain the sample and hold circuit with neat circuit diagram and briefly explain its necessity. (06 Marks)
 c. Define the following with respect to Data acquisition system,
 (i) Accuracy
 (ii) Resolution
 (iii) Precision
 (iv) Repeatability (08 Marks)

OR

- 4 a. Discuss the various issues for selecting DAC. (06 Marks)
 b. Explain successive approximation type ADC with aid of neat diagram. (08 Marks)
 c. Discuss the various issues to be considered while designing a cordless bar code scanner. (06 Marks)

Module-3

- 5 a. List and define the three main processor technologies. What are the benefits of using each of the three different processor technologies? (08 Marks)
 b. What is market window? Explain its importance. (06 Marks)
 c. List the different design metrics in embedded system design. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. What are the advantages of,
 (i) Hardware implementation.
 (ii) Software implementation. (10 Marks)
- b. List and explain three main design technologies. How are each of the three design technologies helpful to designers. (10 Marks)

Module-4

- 7 a. Explain the following : (i) Static (ii) Preprocessor directives (iii) Macros (iv) Volatile. (08 Marks)
- b. Discuss the issues related to selecting a particular software architecture for an embedded system. (06 Marks)
- c. What is task? Describe the three states in which a task can exist. (06 Marks)

OR

- 8 a. With help of pseudocode, explain the round robin with interrupts architecture. Mention a few examples that make use of this architecture. (08 Marks)
- b. What is re-entrant function? List the rules to check if a function is re-entrant or not. (06 Marks)
- c. List the different ways to protect shared data. Explain. (06 Marks)

Module-5

- 9 a. With neat figures, explain the three ways of interfacing multiple keys to a single 8 bit parallel port. (10 Marks)
- b. What is half duplex communication? With neat diagram, explain half duplex serial channel implementation with,
 (i) Tristate logic
 (ii) Open collector logic. (10 Marks)

OR

- 10 a. Explain the architecture of a computer with memory mapped I/O and isolated I/O. (10 Marks)
- b. What is switch debounce? Discuss how a capacitor eliminates switch debounce when,
 (i) Pressed
 (ii) Released. (10 Marks)

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