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Fifth Semester B.E. Degree Examination, Jan./Feb. 2023 Embedded Systems with Internet of Things

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 System. Differentiate between general purpose computing system and embedded system. (06 Marks)
- b. List the important domains and products of embedded systems. (04 Marks)
- c. Explain Harvard vs. Von Neuman processor/controller architecture. (10 Marks)

OR

- 2 a. Classify and illustrate the different types of code storage memory of an embedded systems stores the program instructions. (10 Marks)
- b. Summarize the features of a onboard communication interfaces. (10 Marks)

Module-2

- 3 a. Illustrate the different characteristics of an Embedded systems in detail. (10 Marks)
- b. Define the operational quality attribute of an Embedded system. Explain the important operational quality attributes to be considered in any embedded system design. (10 Marks)

OR

- 4 a. Explain the inner workings of automotive embedded system and communication buses. (10 Marks)
- b. Give an overview of the different market players of the automotive embedded application domain. (10 Marks)

Module-3

- 5 a. Illustrate how sensors and actuators interact with the physical world. Compare sensor and actuator functionality with humans. (10 Marks)
- b. Explain design constraints for wireless sensor networks and outline how data aggregation is carried out in WSN. (10 Marks)

OR

- 6 a. Explain the different technologies of wireless access landscape by breaking them into the ranges. (05 Marks)
- b. Explain three main topology schemes for connecting IOT devices. (05 Marks)
- c. Explain ZigBee IP protocol stack and its features. (10 Marks)

Module-4

- 7 a. Explain the various factors to be considered while selecting a micro controller for an embedded system design. (10 Marks)
- b. Explain the architecture of the 8051 microcontroller with a block diagram. (10 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

- 8 a. Explain the different addressing modes supported by 8051. (10 Marks)
- b. Define hardware software co-design. Explain the fundamental issues in hardware software co-design. (10 Marks)

Module-5

- 9 a. Illustrate the key advantages of the IP suite for the internet of things. (10 Marks)
- b. Explain in detail why optimization is necessary for IP in IOT solutions. (10 Marks)

OR

- 10 a. Explain two main protocols of the transport layer. (10 Marks)
- b. Explain Constrained Application Protocol (COAP) message format and also illustrate how COAP communication carryout in IOT infrastructures. (10 Marks)

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