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10TE765

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020

Embedded System Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. With a neat diagram, describe microprocessor based embedded system. **(10 Marks)**

b. Draw and explain embedded system development life cycle. **(10 Marks)**

2 a. Describe four major blocks of an embedded hardware core. **(06 Marks)**

b. Define addressing modes and explain register direct and indirect addressing modes with necessary diagrams. **(08 Marks)**

c. With a neat diagram, explain ALU. **(06 Marks)**

3 a. List and explain the various types of memories. **(06 Marks)**

b. Draw and explain DRAM inside design using read and write timing diagrams. **(08 Marks)**

c. Explain an associative mapping cache implementation. **(06 Marks)**

4 a. With a neat diagram, explain Waterfall model and spiral model. **(10 Marks)**

b. Explain the system design specifications in an embedded system with an example. **(10 Marks)**

PART – B

5 a. Differentiate between:
i) Program and process
ii) Process and threads
iii) Light weighted and heavy weighted threads **(06 Marks)**

b. Discuss the functions and services of embedded operating system. **(10 Marks)**

c. Explain any two categories of multi-tasking OS. **(04 Marks)**

6 a. Draw and explain virtual machine model operating system architecture. **(06 Marks)**

b. Define TCB and explain the major components of TCB. **(06 Marks)**

c. List and explain the types of stacks. **(08 Marks)**

7 a. Determine the unknown parameter for the system with the following characteristics. The task to be analyzed and improved currently executes in 100 time units and the goal is to reduce execution time to 50 time units. The algorithm to be improved uses 40 time units. Write the inference. **(06 Marks)**

b. Write and analyze linear search algorithm. **(06 Marks)**

c. Write a C program to determine the sum of the elements in an array and obtain complexity function for the same. **(08 Marks)**

8 Write short notes on the following:

a. Memory loading **(08 Marks)**

b. Performance optimization **(06 Marks)**

c. Hardware accelerators **(06 Marks)**

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