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Question Paper Code : 40083

M.E./M.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

First Semester

Applied Electronics

AP 5191 — EMBEDDED SYSTEM DESIGN

(Common to: M.E. Digital Signal Processing/ M.E. Software Engineering/ M.E. VLSI Design)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the main components of an embedded system?
2. List the advantages of single purpose processors.
3. What do you mean by VLIW architecture?
4. Distinguish between timer and counter.
5. What is bus arbitration?
6. List the data transfer rate of IrDA.
7. Write the states of FSM model.
8. Draw the block diagram of concurrent process model.
9. List the basic functions in an RTOS.
10. What are the types of RTOS?

PART B — (5 × 13 = 65 marks)

11. (a) (i) What are the common design metrics that a design engineer should consider? (7)

(ii) Compare GPP, SPP and ASSP along with their block diagrams. (6)

Or

(b) Explain RT level custom single purpose processor design with an example. (13)

12. (a) (i) A timer has a clock frequency of 10 MHz. determine its range and resolution, terminal count needed to measure 3 ms intervals. (7)

(ii) Explain the function of WDT. (6)

Or

(b) Discuss about application-specific instruction set processors (ASIP). (13)

13. (a) Demonstrate the process of parallel communication network using PCI bus. (13)

Or

(b) Draw the state transition graph for an I^2C bus master and explain. (13)

14. (a) Develop the class diagram and state diagram any one engineering application and explain them. (13)

Or

(b) Illustrate the data flow graph model of programming with an example. (13)

15. (a) Demonstrate the design principles when using an RTOS to design an embedded system. (13)

Or

(b) Explain the function of an emulator and an ICE. (13)

PART C — (1 × 15 = 15 marks)

16. (a) What hardware and software resources required for designing an embedded system for an elevator system in a five-story building? List your assumptions and justify your answer with the help of suitable block diagram. (15)

Or

(b) How will you create and display SMS message using T9 keypad of a mobile phone? Use the states, FSM model and state tables for all keys 0, 1 to 9 with T9 keypad. (15)