Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 13471

M.E. DEGREE EXAMINATION, JANUARY 2015.

First Semester

Embedded System Technologies

ET 7102 — MICROCONTROLLER BASED SYSTEM DESIGN

(Common to M.E. Power Systems Engineering, M.E. Power Electronics and drives, M.E. Control and Instrumentation Engineering and M.E. Electrical Drives and Embedded Control)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. The instruction set of the 8051 microcontroller is tailored for control applications. Justify.

2. What do you understand by bit addressable RAM in 8051 microcontroller?

3. What are the addressing modes supported by 8051 microcontroller?

4. Write a 8051 program to multiply two numbers.

5. What are the conditional instructions available in PIC microcontroller?

6. List the differences between PIC and 8051 microcontroller.

7. How code protection is achieved in PIC microcontroller?

8. Differentiate between the Flash and EEPROM memories of PIC microcontroller.

9. How to generate gate pulse using PIC microcontroller?

10. How data conversion is done in PIC microcontroller.

PART B — (5 × 16 = 80 marks)

11. (a) Sketch the internal architecture of 8051 microcontroller and discuss the various blocks.

Or

(b) Discuss in detail the internal memory organization and interrupt handling capability of 8051 micrcocontroller.

12. (a) Design a memory interface to connect a 8K × 8 data ROM in the range 2000_H to $3FFF_H$ and an 8K × 8 data RAM in the address range 8000_H to $9FFF_H$ to the 8051 microcontroller.

Or

(b) Discuss in detail about the RTOS for 8051.

13. (a) Discuss how instruction pipelining is done in PIC microcontroller. Also explain the various addressing modes of PIC.

Or

(b) (i) Discuss in detail about the RAM and ROM allocation procedure in PIC microcontroller. (8)

(ii) Explain program memory consideration of PIC. (8)

14. (a) Explain in detail how analog I/O interfacing with PIC microcontroller can be accomplished using the digital I/O functions of PIC microcontroller.

Or

(b) Discuss how serial interfacing is accomplished in PIC microcontroller.

15. (a) Explain how 8051 microcontroller can interface with liquid crystal displays.

Or

(b) Discuss how PIC microcontroller can control motors. Provide the basic circuitry for doing so.

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