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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Seventh Semester

Branch : Electrical and Electronics Engineering

SYSTEM DESIGN WITH MICROCONTROLLERS (E)

(Old Scheme—Prior to 2010 admissions)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. Compare the features of a microcontroller to that of a microprocessor.
2. Explain the functions of a program counter and PSW in 8051 microcontroller.
3. Explain the single bit instructions in 8051 with examples.
4. Explain the generation of time delay using subroutines. Give an example of a delay subroutine.
5. What are the various modes of operation of Timers in 8051 ? Briefly explain.
6. What are the various sources of interrupts in 8051 ? Explain briefly.
7. Draw the interfacing of an External RAM (8 k x 8 data RAM) to 8051 microcontroller.
8. Explain the interfacing of 7 segment display with 8051 microcontroller. Draw the diagram.
9. What is meant by Data Acquisition systems ? Explain any Data Acquisition system for a stand alone micro-controller system.
10. Discuss the basic configuration of PLCs.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries 12 *marks.*

11. Describe with a neat block diagram the architecture of 8051 microcontroller. Explain the functions of each block.

(12 marks)

Or

Turn over

12. (a) Explain the various Special Function Registers (SFRs) in 8051 and their functions. (8 marks)

(b) Discuss the Register Banks in 8051. (4 marks)

13. (a) What are the various addressing modes in 8051 ? Give one example of each. (6 marks)

(b) What are the various Jump and Call instructions in 8051 ? (6 marks)

Or

14. (a) Write a program to generate 2 kHz square wave on Pin P 1.0 of port 1. (6 marks)

(b) Write a program to find the square root of a number. (6 marks)

15. (a) Mention the applications of Timers and Counters in 8051. (5 marks)

(b) Write a program to count the frequency of an input signal that ranges from 500 Hz to 2.0 kHz. Assume a clock frequency of 6.00 MHz. The input signal is connected to Pin To of 8051. (7 marks)

Or

16. (a) Discuss briefly the methods of serial communication. (5 marks)

(b) Write a program to configure the 8051 in mode 0. Send the data values stored in locations 700 h to 70 Bh through the serial port to an external serial device. (7 marks)

17. (a) Draw the connection diagram of an external 8 K × 8 Data RAM to 8051. (6 marks)

(b) Show how an ADC (0 808) can be interfaced to 8051. (6 marks)

Or

18. With necessary interfacing diagram and program describe how an LCD module can be connected to 8051. (12 marks)

19. With a neat block diagram, explain how will you design a typical microcontroller system for the measurement of frequency of an input signal. (12 marks)

Or

20. Design a typical temperature control system using an 8051 microcontroller. (12 marks)

[5 × 12 = 60 marks]