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

Question Paper Code : 50522

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Seventh/Eighth Semester

Electrical and Electronics Engineering

EE 8018 — MICROCONTROLLER BASED SYSTEM DESIGN

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Recall the guidelines for writing PIC microcontroller instructions

2. What is the need for status registers in PIC l6C6x?

3. Compare hardware interrupts with software interrupts.

4. List the features of timer 2.

5. Mention the steps involved in reading the busy flag.

6. Calculate Vout for the binary input 10011001 if R = 5 K'Ω and Iref = 2 mA in Digital to Analog Converter.

7. Recall the sequence to be followed in pipelining in the ARM processor.

8. Outline the significant features of the ARM instruction set.

9. What is meant by the co-processor interface in an ARM processor?

10. Define the term buffer data and write back in 5 stage pipeline.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Categorize the instruction set of the PIC microcontroller and discuss each set with examples. (8)

(ii) Outline the features of the PIC16C7x microcontroller. (5)

Or

(b) (i) Enumerate the Architecture of PIC 16C7x with neat sketches. (8)

(ii) Outline the necessity of program and data memory organization in PIC 16C6x. (5)

12. (a) (i) Summarize the steps in the activation of interrupts in PIC 16C7x. (6)

(ii) Categorize the different sources of interrupts in PIC 16C6x and explain. (7)

Or

(b) (i) Summarize the importance of key switches in the PIC microcontroller. (7)

(ii) Write a program to create a delay of 1 Sec using timer 0. (6)

13. (a) Explain the mechanism of the Keyboard interfacing with the PIC microcontroller.

Or

(b) Summarize the concept of I^2C Bus in PIC Microcontroller.

14. (a) Examine the role of the Current Program Status Register (CPSR), memory system, supervisor mode, instruction set, I/O system, and ARM exceptions in the ARM processor.

Or

(b) Categorize and explain the memory hierarchy in the ARM processor.

15. (a) Summarize the 5-stage pipeline ARM organization.

Or

(b) Explain how ARM instruction is executed in the ARM processor.

PART C — (1 × 15 = 15 marks)

16. (a) Write an assembly-level program to print a text in the r0 register and subroutine to output a text string immediately following the call.

Or

(b) With the help of an ARM processor, develop an Ericsson – VLSI Bluetooth Baseband Controller chip for Bluetooth-based communication.