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Question Paper Code : 90505

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022

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. Difference between the Von-Neumann and Harvard architecture.
2. What is meant by instruction pipelining?
3. Difference between a subroutine and interrupt service routine.
4. What is the use of the key switch subroutine?
5. How do you check if EEPROM is working?
6. What is the nominal UART baud rate in PIC 16C6x/7x?
7. Difference between RISC and CISC machine.
8. What is the difference between a big-endian and a little-endian data representation?
9. Draw the 5-stage pipeline ARM organization.
10. What is meant by memory bottleneck?

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail with a neat block diagram the architecture of PIC 16C7X.

Or

- (b) Discuss in detail the register file structure and addressing modes of PIC 16C6x/7x.

12. (a) Describe in detail the Timer2 scaler initialization and IntService interrupts service routine.

Or

- (b) (i) Discuss with a neat diagram about the Keypad and soft key interface. (6)
- (ii) Describe the state machines and key switches. (7)

13. (a) Explain the I²C bus operation and bus subroutines.

Or

- (b) Describe in detail ADC and its use in PIC 16C6x/7x

14. (a) Discuss in detail with visible registers structure about the ARM programmer's model.

Or

- (b) List the different types of ARM instructions and explain in detail the Data processing and control flow instructions.

15. (a) Explain with the neat diagram about the 3-stage pipeline ARM organization.

Or

- (b) Discuss in detail the ARM floating-point architecture.

PART C — (1 × 15 = 15 marks)

16. (a) Design a PIC microcontroller-based Hearing AID system and explain it with a neat diagram.

Or

- (b) Give the design methodology for designing of Electronic Voting Machine (EVM) an embedded computing system.