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Question Paper Code : 40561

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Sixth/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 microprocessor and microcontroller.
2. What is meant by pipeline architecture?
3. Difference between internal and external interrupts.
4. What is meant by a loop time subroutine?
5. How the baud rate is fixed in UART?
6. Calculate the values of the LSB, MSB and full-scale output for an 8-bit DAC for the 0 to 10 V range.
7. What are the advantages and disadvantages of RISC architecture?
8. What is meant by memory hierarchy?
9. What is the difference between parallel processing and a co-processing?
10. List the real-time ARM-based applications.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the architecture of PIC16C7x microcontroller with a neat diagram.

Or

- (b) Describe the instruction set and the various addressing modes in PIC microcontrollers with examples.

12. (a) Explain the operation and programming of timers in PIC microcontroller with a suitable example application.

Or

- (b) Discuss the front panel I/O, soft keys and key switches with a neat diagram.
13. (a) Discuss the working principle and application of the I²C bus in peripheral chip access.

Or

- (b) Describe the working of ADC and sensor interfacing with the PIC microcontroller.
14. (a) Explain the ARM architecture and its support for development tools.

Or

- (b) Discuss the ARM architectural support for operating systems.
15. (a) Describe the execution of ARM instructions using the 5-stage pipeline architecture supported by a clear flow diagram.

Or

- (b) Explain the ARM architectural features that support high-level languages and their importance in embedded applications.

PART C — (1 × 15 = 15 marks)

16. (a) Design and explain a PIC microcontroller-based Electrocardiogram (ECG) system with a neat block diagram.

Or

- (b) Explain the ARM-based design methodology of a digital camera with a neat block diagram.