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Question Paper Code : 91009

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fifth/Sixth/Seventh Semester

Electrical and Electronics Engineering

EE 3018 — EMBEDDED PROCESSORS

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Which are the different conditional flags of ARM processor?
2. What do you mean by pipeline? List the different stages of pipeline in ARM processor.
3. What is the use of T, F, and J bits in CPSR?
4. List the noticeable differences between ARM and Thumb instruction.
5. What is the use of Timer Control Register (TCR)?
6. What is meant by resolution of an ADC converter?
7. Write a brief note on EEPROM in ARM.
8. Contrast CAN and I^2C protocol.
9. What is a single board embedded processor?
10. What is Raspberry Pi OS?

PART B — (5 × 13 = 65 marks)

11. (a) With a necessary block diagram explain the ARM7TDMI processor architecture. Also show the complete registers for the processor modes and identifying the active registers for the same.

Or

(b) What is an Interrupt? How many interrupts are there in ARM processor? Explain them in order of their priority. Write down their vector addresses and their significance.

12. (a) With suitable examples, explain the concept of thumb instruction in ARM processor.

Or

(b) Write an ALP to arrange a series of 32 bit numbers in ascending order.

13. (a) Write down the process of 'stepper motor interfacing' with ARM Processor. Draw the circuit diagram and explain with help of flow chart/pseudo code. How will you change the direction of DC Motor?

Or

(b) List out the features of UART in ARM processor. With a neat sketch explain the operation and programming of UART.

14. (a) What is a SPI bus? Where is it used? Describe the frame format and working of SPI Protocol with features.

Or

(b) Write short notes on the following protocols:

(i) CAN and (6)

(ii) I^2C (7)

15. (a) With a neat sketch explain the architecture of Raspberry Pi and its booting Process.

Or

(b) Discuss in detail the various Raspberry Pi interfaces used for data transfer.

PART C — ($1 \times 15 = 15$ marks)

16. (a) What is the function of Memory Protection Unit (MPU) in ARM processor? Explain the programmer's model of MPU with complete description about the registers that control the same MPU.

Or

(b) Explain the format of LDR instruction used in ARM, in each of the three addressing modes pre-index with write-back, pre-index and post-index.