.July-22-00380

B. Tech. EXAMINATION, 2022

Semester VI (CBCS)

ADVANCED MICROCONTROLLERS FOR
EMBEDDED SYSTEMS

EC-601

Time : 3 Hours   *Maximum Marks : 60*

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory. Use of non-programmable calculator is allowed.

Section A

1. Design an Embedded System that flashes LEDs in a 0101, 0110, 1010, 1001 binary repeating pattern. **10**

2. Perform the operation 0.2×0.2 in short real floating-point format. Determine the difference between what you got and what you should have gotten (0.04). This error has two components : truncation error that results in the approximation of 0.2 itself and round off error that occurs during the multiplication.   10

Section B

3. Explain, how exceptions and interrupts are handled in ARM ?   10

4. Write in detail about Hibernation Module on TIVA.   10

Section C

5. Explain in detail SPI and UART Protocol.   10

6. Write the flowchart and algorithm to interface digital external device.   10

Section D

7. Explain wireless sensor networks with design examples.   10

8. Explain NFC Protocol and its applications.   10

(Compulsory Question)

9. (a) Describe the differences between Neumann and Harvard Architectures.   2

(b) How much RAM and ROM are in TM4C123 ? What are the specific address ranges of theses memory components ?   2

(c) What happens if you execute these four assembly instructions :   2

PUSH {R1}

PUSH {R2}

POP {R1}

POP {R2}

(d) For each ADC parameter give a definition in 20 words or less :   2

precision, range, resolution.

(e) What are Analog Comparators ?   2

(f) What is I2C ?   2

(g) Explain Baud rate concept.   2

(h) Write embedded networking fundamentals.   2

(i) Why Bluetooth should use low energy ?   2

(j) What is the use of UART in communication ?   2