



B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Fifth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECI5206: Embedded Processor Architecture

COURSE OUTCOMES

- CO1:** Recall the concepts of the Microprocessor and its variants.
CO2: Explain the architecture of ARM7 embedded processor.
CO3: Explain the ARM7 ISA and illustrate assembly level programming.
CO4: Explain the organization concepts of the embedded processor.
CO5: Explain the BUS architectures involved with ARM processor.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|---|-----|-------------------|
| 1. List the components of microprocessor system. | CO1 | [K ₁] |
| 2. Differentiate between data bus and control bus of ARM processor. | CO1 | [K ₂] |
| 3. Interpret the current processor status register (CPSR) of ARM processor. | CO2 | [K ₂] |
| 4. Compare restoring and non-restoring division algorithm. | CO2 | [K ₂] |
| 5. How pre-indexed addressing mode simplifies the process of ARM programming. | CO3 | [K ₂] |
| 6. Infer on Hardwired and Microprogrammed control unit of ARM processor. | CO3 | [K ₂] |
| 7. How the performance of the cache memory is measured using Hit Ratio. | CO4 | [K ₂] |
| 8. Relate the different types of data hazards? | CO4 | [K ₂] |
| 9. Outline the significance of advanced Microcontroller bus architecture. | CO5 | [K ₂] |
| 10. Interpret the hardware-independent ARM software developer system. | CO5 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|--|----|-----|-------------------|
| 11. a) Explain the MIPS processor architecture with neat sketch. | 8 | CO1 | [K ₂] |
| b) Compare the performances of system on chip and Single board computer. | 8 | CO1 | [K ₂] |
| 12. a) Draw the architecture of ARM Cortex M3 processor and elaborate the functions. | 10 | CO2 | [K ₂] |
| b) Interpret the types of barrel shifter in ARM processor with examples. | 6 | CO2 | [K ₃] |

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| 13. | a) | Build an assembly language program to display “Hello World” using ARM processor. | 8 | CO3 | [K ₃] |
| | b) | Illustrate the principle of little-endian and big-endian ARM machines with examples. | 8 | CO3 | [K ₃] |
| 14. | a) | Elaborate on memory organization of virtual memory system in ARM processor. | 8 | CO4 | [K ₂] |
| | b) | Explain the data path and control mechanism of ARM processor. | 8 | CO4 | [K ₂] |
| 15. | a) | Illustrate the advanced microcontroller bus architecture with examples. | 8 | CO5 | [K ₃] |
| | b) | Outline the JTAG boundary scan architecture with neat sketch. | 8 | CO5 | [K ₂] |
| 16. | a) | Make use of booth’s multiplication algorithm that multiplies two signed binary numbers in 2’s complement notation. | 10 | CO2 | [K ₃] |
| | b) | Summarize the general purpose registers in ARM processor. | 6 | CO2 | [K ₂] |
