Prerana Educational and Social Trust (R.)
PES INSTITUTE OF TECHNOLOGY AND MANAGEMENT
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Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi, Recognised by Govt. of Karnataka
Department of Computer Science & Design

EMBEDDED SYSTEMS (BIS714C)

ASSIGNMENT-2

Assigned Date: 02/11/2025

Submission Date: 08/11/2025

ANSWER ALL QUESTIONS. Write complete instructions with examples in Module-5.

Module 4 – ARM Basics & Embedded Systems
1. Differentiate between i) Microcontroller and Microprocessor ii) RISC vs CISC iii) Applications of ARM Microcontroller
2. Write a note on i) RISC design philosophy (4 rules) ii) ARM design philosophy
3. Explain the ARM embedded device architecture with a neat diagram. (Embedded System hardware/hardware components/AMBA bus technology)
4. Describe embedded system software components and their roles.
5. With a neat diagram, explain ARM core dataflow model. (general purpose registers and special registers)
6. Describe the Current Program Status Register (CPSR). (monitor & control operations)
7. Discuss ARM Processor Modes and Banked Registers with neat figures.
8. What is ARM pipeline? Illustrate the stages in ARM 9 and ARM10 with example.
9. Describe core extensions in ARM with neat block diagram.

Module 5 – Instruction Set (Write before and after execution details)
1. Explain different data processing instructions in ARM with examples. (MOV, MVN..)
2. Explain different ARM arithmetic instructions with examples. (ADD,RSB,ADC…)
3. Discuss ARM logical and compare instructions with examples (AND, EOR, CMP, CMN, TEQ, TST)
4. Explain barrel shifter operations with neat figure and examples. (LSL, ASR, ROR…)
5. Explain branch instructions in ARM with execution flow and examples. (B, BL, BX)
6. Describe single-register load/store addressing modes with syntax and examples
7. Describe multiple-register load/store addressing modes with syntax and examples.
8. Write a note on i) Stack operation in ARM ii) Swap (Both with eamples)
9. Explain software interrupt (SWI) instruction and their usage. (complete description with example).
10. Describe Program Status Register instructions and usage. (MRS, MSR)
11. Discuss coprocessor instructions in ARM with example. (CDP, MRC MCR, LDC STC)
12. Compare conditional execution in ARM instructions (e.g., EQ, NE conditions).

Note: MLA, ASR, BIC, CMN, MVN, MRS, MSR, RSC, LDR, STRH, SWP (Exam Samples)