PES UNIVERSITY

# Department of Computer Science & Engineering
# Microprocessor & Computer Architecture

## UNIT 1 Question Bank

TOPIC: INTRODUCTION TO MICROPROCESSOR, ARM INSTRUCTION SET

1. Differentiate between Microprocessor and Microcontroller.
2. Differentiate between computer organization and Computer Architecture.
3. What are the main features of ARM architecture?
4. Explain the term “Banked Register” in ARM.
5. Explain terms: CPSR register and Processor modes.
6. Explain ARM7 Programmers model
7. Explain the three stage pipelining implemented in ARM processor.
8. What is the function of barrel shifter in ARM data flow model?
9. Explain the different addressing modes of the arm processor
10. Explain the instruction BIC of arm processor
11. Write an assembly program to divide a 32-bit number by an 8-bit number.
12. Tell about ‘Single Data Transfer’ and ‘Multiple Data Transfer’ in ARM.
13. What is the use of various directives?
14. Explain ARM data processing instructions.
15. What is output of the following instruction:
    MOV R0, R2, ROR #2 where R2=0x00000031
16. Explain Arithmetic instructions.
17. Explain LDMIA, LDMIB, LDMDA, LDMDB WITH EXAMPLE.
18. Explain addressing modes used in Stack
19. Write ALP to find GCD of given numbers
20. What is instruction encoding? Encode the following instruction.
    ADDS R1, R0, R2,LSR R4
21. Explain 3, 2 and 1 address instructions in ARM processors with an example to each.
22. Encode the following instructions:
    a. MUL R4,R5,R3
    b. SMLAL R1,R2,R4,R5
23. Write assembly language program to find the factorial of an integer stored in some memory location and display the factorial on the standard o/p.
24. How can IRQ interrupt be disabled or enabled? Write an example for the same. Also, explain whether the processor accepts the other exceptions while IRQ is executed?
25. Encode the following instructions:

    a.LDMFD R13, {R2-R8}
    b. STMEA R13, {R0-R5}

26. Write the assembly equivalent code for the following code :
    if (A==B) AND (C! =D):A=A+1.
    where A, B, C, D are memory locations having some integer values.
27. Is it possible to modify the contents of CPSR? If so how? Explain.
28. How are nested subroutines executed? Explain.
29. Explain the RISC features which were rejected by ARM
30. What are the different conventions to pass the parameters to the procedure call in ARM
31. Encode the following instructions :
    a. LDR R0,[R1,#4]
    b. STR R0,[R1],#4
32. What is instruction encoding? Why is it required? Who does it?
33. Is it possible to modify the contents of CPSR? If so how? Explain. (Explore if not taught in the class)
34. Encode the following instructions:
    a. MOV R0, R2, LSL #2
    b. ADD R1, R2, R3, ASR R4