

C028633(028)

B. Tech. (Sixth Semester) Examination, April-May 2022

(AICTE Scheme)

(Electronics & Telecommunication Engg. Branch)

ARM SYSTEM ARCHITECTURE

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. Part (a) of each question is compulsory, carrying 4 marks. Attempt any two parts from (b), (c) & (d) from each questions, each carrying 8 marks.

Unit-I

1. (a) Discriminate between the ARM & Thumb mode of operation.
- (b) Explain the pipelining concept of ARM7 version and also evaluate the pipeline speed, efficiency and throughput. Also explain why stall cycles add sometimes in the pipeline?

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- (c) What are the different processing modes of ARM7 briefly explain with the required set of registers in each?
- (d) What is the difference between RISC and CISC architecture of processors?

Unit-II

2. (a) Brief on the ARM9TDMI nomenclature.
- (b) What do you mean by AMBA bus architecture of ARM? What are AHB/API types of AMBA?
 - (c) What do you mean by FPU in ARM processors? Write multiplication method with and without FPU unit in ARM.
 - (d) Briefly explain 5 stages of pipelining in ARM9 with its architectural block diagram and also explain the need of both multiplier, barrel shifter and control unit in instruction execution.

Unit-III

3. (a) Write the difference between Branch (B) and Branch link (BL) operation of ARM codes.

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- (b) Write a program to transfer the 128 bytes of data from source location 'SCR' to the destination location 'DST' with the help of multiple register load store operation of ARM also brief multiple register load store operation.

- (c) Briefly explain the working of following instruction.

- (i) SUB r0, r1, r2
- (ii) RSB r0, r1, r2
- (iii) SBC r0, r1, r2
- (iv) EOR r0, r1, r2
- (v) BIC r0, r1, r2
- (vi) TSC r0, r1, r2
- (vii) TEQ r0, r1, r2
- (viii) LDR r0, [r2, #4]

- (d) What do you mean by Memory mapped I/O? Why it is used in ARM7 TDMI architecture but not in ARMTDMI9?

Unit-IV

4. (a) Write the difference between Interrupts and Exception.

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- (b) What do you mean by ARM & Thumb inter working?
- (c) What are the different Exceptions and their priorities with vector addresses of ARM7? Also explain the different process mode of the ARM pertaining to each exception.
- (d) Briefly explain the Arm Developer suits used to simulate the ARM programming along with the necessary C library.

Unit-V

5. (a) Write the difference between Stack and Heap.
- (b) Draw and explain the ROM/RAM Remapping of ARM based system also figure out the reserve portion for the exception vector table, data segment and stack segment in memory mapping.
 - (c) Briefly explain the process handling of nested interrupt in ARM based system.
 - (d) How the variables get allocated in the stack heap? Briefly explain with the help of suitable C programming. Also write suitable C code to explain the stack overloading.