

Module IV

1. What are the data types supported by ARM programming high level languages?
2. Represent 1352 using IEEE 754 single precision format
3. Write a note on floating point number formats to represent real numbers (simple precision, double precision and double extended precision)
4. Explain packed decimal and extended packed decimal formats for representing real numbers
5. Explain ARM floating point architecture with the help of a diagram and explain how floating point numbers are handled.
6. Explain different ways by which operands are represented by using pointer arithmetic.
7. Explain how the compiled codes will translate if the following conditional statements are executed. (a) if-else (b) switch (c) for loop (d) while loop (e) do while loop
8. Explain how functions and procedures are handled in ARM architecture.
9. With the help of a diagram explain ARM C program address space model
10. **Write C program to print 'Hello World'.**

```
/* Hello World in C */
#include <stdio.h>
int main() {
printf( "Hello World\n" );
return
```

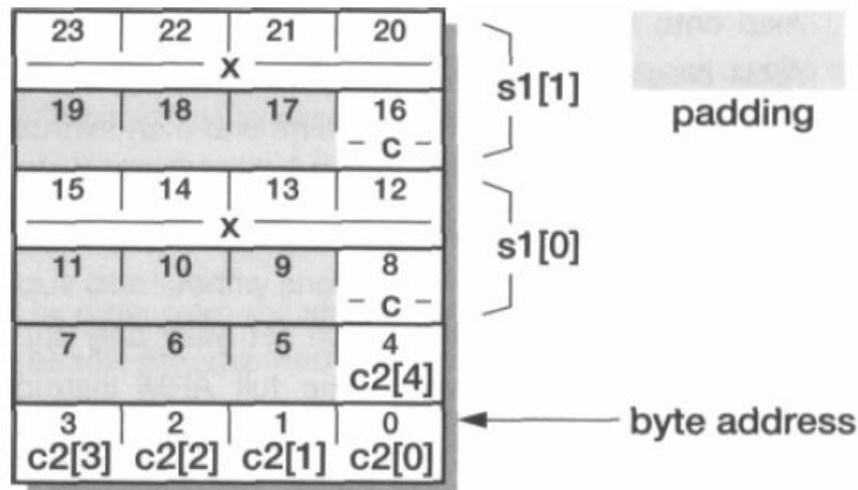
11. **Write the number 2001 in 32-bit binary, binary-coded decimal, ASCII and single-precision floating-point notation.**

```
Binary: 2001      = 1024 + 512 + 256 + 128 + 64 + 16 + 1
                = 0000000000000000000000111110100012
BCD:    2001      = 0010 0000 0000 0001
ASCII:   2001      = 00110010 00110000 00110000 00110001
F-P:    2001      = 1.1111010001 x 21010
                = 01001001 11110100 01000000 00000000
```

12. **Show how the following data is organized in memory:**

```
struct SI { char c; int x; }; struct
S2 {
char c2[5];
SI si [2]; }
example;
```

The first structure statement only declares a type, so no memory is allocated. The second establishes a structure called 'example' comprising an array of five characters followed by an array of two structures of type SI. The structures must start on a word boundary, so the character array will be padded out to fill two words and each structure will also occupy two words. The memory organization is therefore as shown below:



13. Write a note on thumb instruction set, entry and exit in thumb mode, and exceptions in thumb mode
14. Draw and explain thumb programmer's model. Show how thumb bit is used in CPSR register.
15. Distinguish between thumb single data transfer instructions and thumb multiple data transfer instructions.
16. What is thumb mode? Draw CPSR register format of ARM processor
17. Explain the thumb data processing instructions with examples
18. Explain thumb branch and software interrupt instruction execution
19. With the help of a diagram explain thumb implementation in ARM processor (Thumb instruction decompressor)
20. Explain ARM memory interface in detail with relevant diagrams.
21. Differentiate between big endian and little endian memory organization
22. Illustrate the block diagram of AMBA architecture. What are the different types of buses used in architecture?
23. What are the uses of memory in ARM system?

Module V

1. What is an operating system? What are its services?
2. What is a kernel? With the help of a diagram explain the services of a kernel.
3. Explain different types of kernels?
4. Write a note on GPOS and RTOS and their differences.
5. What are the services of real time kernel? Explain.
6. What are the differences between hard real time and soft real time systems?
7. Distinguish between thread and process.
8. What is a process? Explain the structure and memory organization of a process.
9. What is Process Life Cycle? Explain the various activities involved in Process Life Cycle?
10. What is a thread? With the help of diagrams show the memory organization of a process and its threads, and multithreading.
11. What is RTOS? Distinguish soft real time and hard real time systems? Explain the types of real time OS?
12. Explain the basic functions in the RTOSs?
13. Differentiate between multitasking and multiprocessing.
14. Describe how memory management is done in RTOS.
15. What is multitasking? What are the different types of multitasking?
16. What is task scheduling? Explain with the help of diagram.
17. Write a note on the following non pre-emptive type scheduling algorithms with the help of examples. (a) First come First served (b) Last com First served (c) Shortest job first (d) priority based scheduling
18. Write a note on the following pre-emptive type scheduling algorithms with the help of examples. (a) Shortest job first (b) Round Robin (c) (d) priority based scheduling
19. Show the different states of a task. Extend the types of multitasking scheduling algorithms.
20. What is the need of task scheduling?
21. Explain any two pre-emptive scheduling algorithms with example.
22. Explain shared memory, message passing and RPC in task communication.
23. What is task synchronization. Explain task synchronization issues.
24. Define the following terms in task synchronization (a) deadlock (b) Mutual Exclusion (c) Live lock (d) starvation
25. Explain (a) racing (b) priority inversion in task synchronization issues.
26. What are the different task synchronization techniques?
27. What is deadlock? Extend the conditions favouring to it. Explain the ways of detecting and preventing deadlocks.
28. What are device drivers? Explain their role and services.
29. What are the requirements to be considered while choosing an RTOS?