

# **PCPI [22UCSC402]**

## **Question Bank**

### **UNIT 1:**

1. Illustrate the CISC Processors Architecture. write the advantages and disadvantages of CISC processors.
2. Illustrate the CISC Processors Architecture. write the advantages and disadvantages of CISC processors.
3. Explain the block diagram of Microprocessor and Microcontroller in terms of advantages and features.
4. Compare RISC and CISC processors.
5. Write the Evolution of Microprocessors from first generation to fourth generation.
6. List the features of Different types of Microprocessors.

### **UNIT 2:**

1. Illustrate the operating modes of 8255 PPI.
2. List the salient features and explain interrupt service register, interrupt request register of 8259 interrupt controller.
3. Illustrate the working of 8257 DMA with neat diagram.
4. Discuss the block diagram of 8255 and explain the function of each block.
5. Explain the different operating modes of 8255.

### **UNIT -3**

6. Explain the major design rules of RISC architecture. List the special features of ARM processor design.
7. Explain the register file of ARM processor with a neat sketch, and CPSR register.
8. Sketch a neat diagram of ARM data flow model and explain.
9. Explain two architecture levels of bus. Explain AMBA bus protocols.
10. Explain the different modes of operations in ARM 7 processor.
11. Define pipelining and Explain 3-stage pipelining.
12. Explain the block diagram of ARM based embedded device.
13. Discuss the Exceptions, interrupts, and interrupt vector table of ARM 7 processor.
14. Write ALP instructions to perform the following operations, also mention which flags are affected.
  - i. Load 08 in R0, divide it by 2 and store the result in R3 .
  - ii. Assume R6 = 0X80, add 0XEC00 to R6 and store the sum in R4.
  - iii. Assume R12= 0X12, subtract 0XFF000000 from R12, place the result in R7.
  - iv. Assume R7= 0X0000000F, add value 0X123456AB to R7, place the result in R12.
  - v. Assume R1= 0X06, write instruction to find square of value in R1 and place result in R3.
15. Translate the following conditions into a single ARM instruction.
  - a. Assume any value in the registers R3 and R6. Write single instruction to add R3 and R6 only if N is clear. Store the result in R7.

- b. Assume any value in the registers R3 and R6. Write single instruction to add R3 and R6 only if Z is clear. Store the result in R7.
  - c. Assume any value in the registers R7 and R12. Multiply R7 and R12, put result in R3 R2 only if c=1, z=0.
  - d. Assume any value in the registers R6 and R8. Compare R6 and R8, only if Z is clear.
  - e. Assume any value in R6. Write instruction that set bits 0, 4, & 12 in R6 and leave the remaining bits unchanged.
16. Write ALP instructions for the following.
- a. Compute 2's complement of the given number 03 in R3 and store the result in R6.
  - b. Assume the initial value in CPSR =nzcvtIFt\_SVC, write the instructions to unmask the IQR interrupt in CPSR register.
17. Assume i/p in R0=36, write an ALP to represent the result as R8=03 (MSB of i/p) and R7=06 (LSB of i/p).
18. Illustrate with examples the usage of LDR instruction with different addressing modes.
19. Illustrate with examples the different forms of MOV, MVN, MOVS instructions.
20. Illustrate with examples the usage of LOAD/ STORE Multiple instructions with different addressing modes.
21. Illustrate with examples the usage of LDMIA, LDMIB/ STMIA,STIB Multiple instructions with different addressing modes
22. Illustrate with examples the BRANCH instructions (conditional and unconditional).

#### **UNIT-4:**

23. Illustrate the programming model of THUMB mode of operation and advantage over normal ARM mode of operation.(Veneer).
24. Explain available Exceptions and vector table in LPC2148 ARM7 processors.
25. Illustrate the Interrupt handling schemes (nested and non-nested)in detail.
26. State the Difference between THUMB and ARM
27. Write an ALP to find the largest in a given array of 10 elements and store the result in RAM location (0X9000). **[ARM]**
28. Write an ALP to find the smallest in a given array of 10 elements and store the result in RAM location (0X9000) **[ARM]**
29. Translate the following C code into assembly language program, assume arrays A and B contain only byte-wide data starting address of RAM being 0X40000000, index i is integer.
- ```

for (i=0; i<8; i++)
{
    A[i] = B[7-i];
}

```
30. Translate the following C code into assembly language program, assume arrays A contain only byte-wide data starting address of RAM being 0X40000000, index i is integer.

```

Sum=0;
for (i=0; i<6; i++)
{
    Sum+= A[i];
}

```

31. Write an assembly language program to find the length of given string- “ GOD BLESS ALL”, store the result (length of string) in register in R1.
32. State the difference between ARM and THUMB mode of operations. [Hohl- pg.213]
33. Describe why Veneers might be needed in a program (THUMB) execution. How ARM-THUMB interworking established?
34. Illustrate the Stack operation in THUMB mode with examples.

### **UNIT-5**

35. Explain registers associated in programming GPIO's in LPC2148 ARM7 processors (PINSEL, IOSET, IOCLR & IODIR).
36. Write a program to interface LPC2148 ARM 7 processor to rotate DC motor thrice in clockwise and five times in anti-clockwise.
37. Explain PCB (Pin Connection Block) in LPC2148.
38. Write the steps for programming of PLL.
39. Write the steps for Programming of Timer0/Timer1.
40. Write a program to interface LPC2148 ARM 7 processor to blink the LED's one after the other with delay of 50000000

Faculty-in Charge

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