Question Bank for DSP Processor

Module4

1. Compare Von Neumann and Harvard Architecture of processors.
   Or
   List and briefly explain the feature that show that Harvard Architecture of processors is efficient compared to Von Neumann architecture.
2. Illustrate Von Neumann and Harvard Architecture of processors and explain in detail.
3. What is significance of Multiplier and Accumulator (MAC) Unit in DSp? Illustrate and explain the operation of MAC unit.(Li Tan).
4. What is shifter? Explain how shifter helps in handling overflow in DSp?(Li Tan)
5. Explain the operation of circular buffer.
6. Explain Fixed point number representation and Floating point number representation used in DSp s
7. Explain IEEE Floating-Point Formats
8. Convert the Q-15 signed numbers to the decimal.
   a. i)0110100100110100 ii) 1.101101110100010
   b. iii)1010111100110100 ii) 0.101101110100010
9. Find the Q-15 representation for the decimal number

   i) -0.2567 ii) 0.45632 iii) 245 iv) -253

10. Add the following two-Q-15 numbers and convert sum to decimal.

    i)1.101010111000001 + 0.010001111011010

    ii) 1. 1 1 0 1 0 1 1 1 0 0 0 0 0 1 0 + 0.1 0 0 0 1 1 1 1 0 1 1 0 0 1 0
11. Add the following floating-point numbers and determine the sum in decimal. The two numbers are in the format → **4bit (MSB) for exponent and lower 12 bits for mantissa**
    1101 011100011011 + 0100 101111100101

12. Multiply the numbers by converting them to floating format and verify the result. (Use the format specified in above problem)
    0.640136718 x 2^-2 & -0.638183593 x 2^5
13. Add the following two floating-point numbers and check for the overflow
    (Use same format in above problem)
    0111 011000000000 & 0111 010000000000
14. Convert the following IEEE single precision format to the decimal format
    101000000.010…0
15. Convert the following number in IEEE double precision format to the decimal format: 001000 . . . 0:110 . . . 0000

Module5

16. Draw the functional block diagram of TMS320C6713 architecture and explain in detail.

17. List the salient features of TMS320C6713 Digital Signal Processor.
18. Explain Functional units with respect to TMS320C6X processor.
19. Explain the memory configuration of C6x processors.
20. Illustrate and briefly explain internal memory configuration of L2 memory in C6x processor.
21. Illustrate the mode of operation of indirect addressing mode in TMS320C6X processor with examples.
22. Explain in brief the Pipelining operation of TMS320C6X processor with an example.
    Or What is pipelining? Illustrate and explain different stages and phases of pipelining.
23. Explain Fetch and execute packets in TMS320C6X processor.
    Or
    Illustrate how DSp takes care of parallel instructions.
24. Illustrate the working of add, subtract and multiply instruction with respect to TMS320C6X processor showing example.
25. What is AMR register? Explain how it is used in circular addressing mode with an example.
26. What is the bit pattern to be loaded in AMR for following requirement in circular buffer addressing? Write the code segment for the same.
    i) Register B6 has to be used as pointer for circular addressing using Bk1
    ii) Buffer size of 128 bytes to be set.

27. Explain the assembly code format used in DSp
28. Explain with examples ADD/SUB/MPY instructions
29. Explain with examples i)Branch/Move instructions ii)Load/Store instructions
30. Explain the operation done by following instructions
    i. ADD .L1 A3,A7,A7
    ii. LDH .D2 *B2++,B7
    iii. MPY .M2 A7,B7,B6
    iv. NOP 5
    v. LDH .D2 *B2++, B7

    Or

    Identify the addressing modes in the following and explain the operation

    i) ADD ++A7, A8 ii) ADD A7, A8++

    iii) MVKL .S1 x,A4 iv) STW .D2 A1, *+A4[20]

31. What is assembler directive? Identify the operation done by assembler directive **.**float, **.**double, ***.sect.***
32. Illustrate indirect addressing mode with examples.
    Or Explain pre increment, post decrement addressing with examples.
33. What is the hierarchy (priority) of interrupts in C6x processor? Write the interrupt service table.
34. Explain the various interrupt control registers
35. Explain how DSp processes the maskable and nonmaskable interrupts.
36. Explain Interrupt Acknowledgment process in detail.