C

Question Paper Code: 95201

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Computer Science Engineering

21UCS305 - Computer Organization

(Common to IT, CSBS and AI&DS Engineering branches)

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The addressing mode used in an instruction of the form ADD X, Y is _____.   CO1- U

    (a) Absolute   (b) indirect   (c) index   (d)none of these.

2. The partial reminder is restored by adding the divisor to the negative   CO1- U
   difference is called_____.

    (a) comparison method   (b)Restoring method   (c) non restoring method   (d) divide stop.

3. _____ occurs during an instruction. all subsequent instructions that may   CO1- U
   have been partially executed and discarded.

    (a) Precise exception   (b) imprecise exception.   (c) Divide by zero   (d) Inexact

4. Memory which is electrically erasable is_____.   CO1- U

    (a) EBROM.   (b) EEPROM.   (c) ROM.   (d) PROM.

5. During DMA acknowledgement cycle, CPU relinquishes   CO1- U

    (a) Address bus only   (b) Address bus & control bus

    (c) Control bus & data bus   (d) Data bus & address bus

PART – B (5 x 3= 15 Marks)

6. Write a program that can evaluate the expression   CO2- App
   A x B + C x D
   In a single Accumulator processor. Assume that the processor has Load, Store,
   Multiply, Add Instructions and that all values fit in the accumulator

7. Find the 2's complement form for –39,-120.   CO2- App

8. What is called static and dynamic branch prediction? CO1- U

9. An address space is specified by 24 bits and the corresponding memory space by 16 bits. How many words are there in the virtual memory and in the main memory? CO2- App

10. What is the need for DMA transfer? CO1- U

PART – C (5 x 16= 80Marks)

11. (a) (i) Register R1 and R2 of computer contain the decimal values 1200 and 4600. What is the effective address of the memory operand in each of the following instruction? CO2- App (8)
(a) Load 20(R1),R5
(b) Move # 3000, R5
(c) Store R5, 30(R1,R2)
(d) Add – (R2),R5

(ii) Assume the following register and memory contents in an ARM computer Register R0 contains 1000. Register R1 contains 2000. Register R2 contains 1016. Register R6 contains 20. Register R7 contains 30.The numbers 1,2, 3,4,5,and 6 are stored in successive word location starting at memory address 1000. What is the effect of executing each of the following three short instruction blocks, starting each time from the given initial values? CO2- App (8)
(a) LDR R8,[R0]
(b)LDR R9,[R0,#4]
(c)ADD R10,R8,R9
(d) STR R0,R10

Or

(b) (i)Assume that register r0 and r1 has the value as given in the table. CO2- App (8)
R0=0000 0000 0000 0000 0000 1101
R1=0000 0000 0000 0000 0011 1100
Determine several logical operations on these register
(ii) Write a sequence of instructions that will compute the value of y $= x2 + 2x + 3$ for a given x using CO2- App (8)
- Three-address instructions
- Two-address instructions
- One-address instructions

12. (a) Explain the Hardware implementation of floating point addition- CO1- U (16)
subtraction unit with a neat diagram.

Or

(b) Explain hardware implementation of sequential multiplication unit CO1- U (16)

13. (a) Explain in detail about Flynn's classification with suitable diagram. CO1- U (16)

Or

(b) What is data hazard? Explain the methods for dealing with the data CO1- U (16)
hazards.

14. (a) What is virtual memory? Explain the relation between address space CO1- U (16)
and memory space in a virtual memory system along with its
memory table for mapping?

Or

(b) Explain the organization of magnetic disk and magnetic tape in CO1- U (16)
detail.

15. (a) Draw and explain the block diagram of typical DMA controller CO1- U (16)

Or

(b) Explain the general steps involved in interrupt driven data transfer. CO1- U (16)

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