Reg. No. : | | | | | | | | | | |

Question Paper Code: 53203

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Computer Science and Engineering

15UCS303 - COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to Information Technology)

(Regulation 2015)

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 (R2) ,R0, is _____. CO1- U

   (a) direct (b) Indirect (c) absolute (d) none of these

2. ------- register keeps track of the execution of a program CO1- R

   (a) IR (b) MAR (c) PC (d) MBR

3. MAR corresponds to CO1-R

   (a) Address (b) Data (c) control (d) none of these

4. Single precision Floating point numbers are represented in CO2- R

   (a) 16 bits (b) 32 bits (c) 48 bits (d) none of these

5. _____ replacement algorithm overwrite the block which is not referred for long time CO4- R

   (a) LRU (b) LILO (c) LIFO (d) none of these

PART – B (5 x 3= 15Marks)

6. List any three addressing modes with examples. CO1- U
7. Determine the mechanism to convert parallel adder Fast adder. CO2 -U
8. Show the working of Booths algorithm for 01010 as Multiplier. CO2- App
9. List the different mapping techniques used in Cache memory. CO4- U
10. Define : Spatial locality and Temporal locality. CO4- U

PART – C (5 x 16= 80Marks)

11.	(a)	List the different addressing modes and explain them with suitable examples	CO1- U	(16)
		Or		
	(b)	With suitable block diagram discuss the functional units of a computer in detail.	CO1 -U	(16)
12.	(a)	Draw the flowchart and Hardware for the Booths multiplication algorithm. Calculate the product of the signed8-bit integers 75 and -15 using the Booths multiplication Algorithm. You should show the contents of each register in each step.	CO2 -App	(16)
		Or		
	(b)	Draw the flowchart for the Binary division algorithm for unsigned numbers Calculate 74 divided by 20 using the hardware using the restoring Division. You should show the contents of each register on each step. Assume both inputs are unsigned 8-bit integers.	CO2- App	(16)
13.	(a)	Explain the need for multiple execution units and out of order execution in Superscalar processor.	CO3 -U	(16)
		Or		
	(b)	(i) Examine the impact of 2 state and 4 state algorithm in dynamic Branch prediction .	CO3- Ana	(8)
		(ii) Discuss in detail about Data hazard with suitable example and provide the hardware approach to handle the hazard,	CO3- U	(8)
14.	(a)	Discuss in detail about memory Hierarchy.	CO4 -U	(16)
		Or		
	(b)	Discuss the six basic cache optimization techniques to improve the cache performance.	CO4- U	(16)
15.	(a)	Explain the concept of address translation in virtual memory with suitable illustrations.	CO4 -U	(16)
		Or		
	(b)	Define : Bus arbitration. What is the need for DMA controller? Discuss in detail about the bus arbitration techniques used in the DMA transfer.	CO4- U	(16)