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

Question Paper Code:R3I05

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

Third Semester

CSE (Internet of things)

R21UIO305- COMPUTER ORGANIZATION AND ARCHITECTURE

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	What is the role of MAR and MDR?	CO1-U	
2.	What is Control unit ?	CO1-U	
3.	Draw the circuits which perform both addition and subtraction.	CO3-U	
4.	Convert (100101)2 to decimal.	CO2-App	
5.	A superscalar processor can execute 3 instructions per cycle. If you have a sequence of 9 independent instructions, how many cycles will it take to complete all instructions?	CO2-App	
6.	Define Pipeline and Characteristics of Pipeline.	CO1-U	
7.	What are ways to improve the Cache performance?	CO1-U	
8.	Define Virtual Memory and need for virtual memory	CO1-U	
9.	Explain the role of the DMA controller in reducing CPU workload during data transfers between memory and I/O devices.	CO2-App	
10.	What is bus arbitration?	CO1-U	

PART – B (5 x 16= 80 Marks)

11.	(a)	Explain in detail the various components of computer system with neat diagram	CO1-U	(16)
		Or		
	(b)	Explain in detail about instruction and instruction sequencing. Compare their relative merits and demerits, With proper example	CO1-U	(16)
12.	(a)	Multiply each of the following pairs of signed 2's complement numbers using the Booth Algorithm. And also explain in detail using a flowchart. (5) * (-4)	CO2-App	(16)

Or

	(b)	Consider 4-bit dividend and 2 bit divisor, show the steps involved in binary division using non-restoring methodology and also explain in detail with a flow chart Dividend 1011 Divisor 0101	CO2-App	(16)
13.	(a)	What is data hazard? Explain the methods for dealing with the data hazards	CO1-U	(16)
		Or		
	(b)	Define parallel processing and explain the flynn's classification of computer with suitable diagram.	CO1-U	(16)
14.	(a)	What is virtual memory? Explain the relation between address space and memory space in a virtual memory system along with its memory table for mapping?	CO1-U	(16)
		Or		
	(b)	Explain the organization of magnetic disk and magnetic tape in detail.	CO1-U	(16)
15.	(a)	Configure a DMA controller in an embedded system to efficiently transfer data between a memory location and a peripheral device, addressing specific operational requirements.	CO2-App	(16)
		Or		
	(b)	How you will implement these techniques in your bus design and Propose techniques to optimize bus performance	CO2-App	(16)