Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth semester B.Tech examinations (S), September 2020

Course Code: CS202

Course Name: COMPUTER ORGANISATION AND ARCHITECTURE (CS, IT)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks

1		What is meant by zero- address instruction?	(3)
2		Design 2×2 array multiplier.	(3)
3		Autoincrement mode is useful for accessing data items in successive memory locations. Justify the statement.	(3)
4		Draw the flowchart for Booth's Multiplication algorithm.	(3)

PART B

Answer any two questions, each carries 9 marks

5	a)	How the byte addresses are assigned across word?	(5)
	b)	Explain the execution of a complete instruction.	(4)
6	a)	Specify the actions needed to execute the instruction Move (R1), R2	(5)
	b)	What is the role of processor stack in subroutine call and return?	(4)
7	a)	Explain restoring method of division with the help of a flow chart.	(5)
	b)	Compare and contrast single bus and multiple bus organization of processor.	(4)

PART C

Answer all question, each carries 3 marks

8		What is the function of interrupt-service routine?	(3)
9		How the time involved in polling process is reduced in interrupted I/O?	(3)
10		Write notes on synchronous DRAM.	(3)
11		Illustrate LRU cache replacement algorithm.	(3)

PART D

Answer any two questions, each carries 9 marks

12	a)	Differentiate the data transfer in programmed I/O and interrupt driven I/O	(5)
	b)	Write about the DMA controller registers that are accessed by the processor to initiate data transfer.	(4)

13 a) Differentiate between associative mapping and set associative mapping. (5)

b) Illustrate the operation of the Small Computer System Interface bus. (4)

14 a) Describe different types of ROM (5)

b) A computer system uses 32-bit memory addresses and it has a main memory consisting of 1G bytes. It has a 4K-byte cache organized in the set-associative manner, with 4 blocks per set and 64 bytes per block. Calculate the number of bits in each of the Tag, Set, and Word fields of the main memory address. (4)

PART E

Answer any four questions, each carries 10 marks

15 a) What are conditional control statements? Represent the following conditional control statement by two register transfer statements with control functions. 4

$If\,(P=1)\ then\ (R1 \leftarrow R2)\ \ else\ if\ (Q=1)\ then\ (R1 \leftarrow R3)$

b) Write notes on status register 6

16 a) Explain horizontal and vertical micro instructions, with suitable examples. 5

b) Explain how control signals are generated in one flip flop per state control logic with the help of a diagram 5

17 Outline the organisation of a full processor unit showing the control inputs to all components. Show with the help of an example, how an instruction is implemented by giving necessary control inputs to different parts of the processor. 10

18 Illustrate the basic arithmetic microoperations in a 4 bit ALU with the help of a parallel adder. 10

19 Explain with the help of an example how control signals are generated using hardwired control. 10

20 Describe the purpose of microprogram sequencing. How is it carried out? 10

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