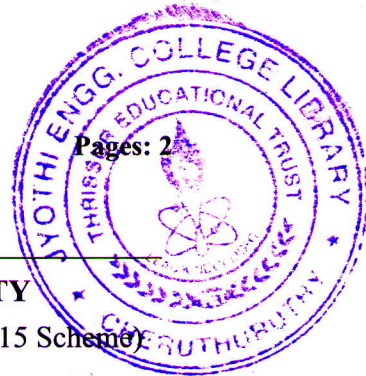


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree (S,FE) Examination August 2021 (2015 Scheme)

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 How are nested subroutine calls internally implemented in a computer? 3
- 2 Index addressing mode is useful in dealing with lists and arrays. Justify the statement. 3
- 3 List the control signals that are activated while storing a word in memory using a single bus organization 3
- 4 Design a 3×2 array multiplier 3

PART B

Answer any two questions, each carries 9 marks

- 5 a) Write notes on one address, two address and three address instructions with proper examples. 5
- b) List and explain any 4 addressing modes with examples 4
- 6 a) Write a program that can evaluate the expression $A \times B + C \times D$ in a single accumulator processor. Assume that the processor has Load, Store, Multiply and Add instructions, and that all values fit in the accumulator. 5
- b) Divide 24 by 7 using restoring division algorithm 4
- 7 a) Draw and explain the flowchart of floating point multiplication algorithm 5
- b) Explain multiple bus organization with the help of a diagram 4

PART C

Answer all question, each carries 3 marks

- 8 List the functions of I/O interface circuits. 3
- 9 Illustrate how various devices are addressed on the USB? 3
- 10 What is MFC signal? How is it related to memory access time? 3
- 11 With a neat diagram explain the structure of a synchronous DRAM 3

PART D*Answer any two questions, each carries 9 marks*

- 12 a) How program controlled I/O is performed using polling? 5
 b) Explain the working of a PCI bus with the help of timing diagrams. 4
- 13 a) Explain internal organization of memory chips with the help of a neat diagram. 5
 b) Explain direct cache mapping with the help of an example. What are the issues associated with direct mapping? 4
- 14 a) Illustrate USB architecture and working with the help of a neat diagram. 5
 b) Write notes on flash memory. List its advantages and disadvantages 4

PART E*Answer any four questions, each carries 10 marks*

- 15 a) Draw the block diagram of the hardware that implements the following register transfer statement: 5
 $yT_2 : R_2 \leftarrow R_1, R_1 \leftarrow R_2$
 b) List and discuss about shift and logic microoperations. 5
- 16 Explain how control signals are generated using PLA control, using an example with a neat diagram 10
- 17 Describe the basic organization of a microprogrammed CPU with the help of a diagram 10
- 18 List and explain the different control organisations with the help of neat diagrams 10
- 19 a) Starting from an initial value of $R=11011101$, determine the sequence of binary values in R after a logical shift-left, followed by a circular shift-right, followed by a logical shift-right and a circular shift left. 5
 b) Write notes on status register. 5
- 20 Explain the design of accumulator. 10
