

Code No.: CS302PC

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CMR ENGINEERING COLLEGE: HYDERABAD  
UGC AUTONOMOUS

II-B.TECH-I-Semester End Examinations (Regular) - January- 2022

COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to CSE, IT, CSC & CSM)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A**

(20 Marks)

1. a) What is Bus? [2M]
- b) Determine need of Register? Write the name of different type of Registers. [2M]
- c) Discuss the principle operation of Microprogrammed control unit. [2M]
- d) Define Processor clock. [2M]
- e) List the steps of Booth's Multiplication algorithm. [2M]
- f) Describe the IEEE representation of Floating point numbers? [2M]
- g) Justify the need of I/O Interface? [2M]
- h) Define Locality of Reference. [2M]
- i) Determine the use of Instruction Pipelining? [2M]
- j) Explain Cache Coherence problem? [2M]

**PART-B**

(50 Marks)

2. a) Sketch and explain the Design of Control Unit? [5M]
  - b) Design the flowchart for Interrupt cycle and explain it. [5M]
- OR**
3. Explain the Arithmetic circuit with a neat diagram and derive the operations? [10M]
4. Explain the following Addressing Modes with suitable example each? a) Direct b) Immediate c) Indexed -Addressing Modes. [10M]
- OR**
5. What are the different types of CPU organizations? Explain each organization with an example in detail. [10M]
6. Evaluate  $(2563)_{10} - (6532)_{10}$  by using 9's and 10's complement and Explain the flowchart for Division algorithm? [10M]
- OR**
7. a) Design the flowchart for Multiplication algorithm? [5M]
  - b) Illustrate  $04 * 02$  with the help of Multiplication algorithm? [5M]
8. Explain the block diagram of DMA transfer with a neat diagram? [10M]
- OR**
9. Consider a cache consisting of 256 blocks of 8 words each, for a total of 2048 words, and assume that the main memory is addressable by a 16-bit address. The main memory has 64K words which are divided into 8192 blocks of 8 words each. Find the number of bits in Tag, Block and Word Field of the main memory address for direct mapping scheme. [10M]
10. Discuss the different conflicts of Instruction Pipelining and explain them? [10M]
- OR**
11. a) Justify and explain the need of Pipelining in detail? [5M]
  - b) Discuss Inter-process arbitration? [5M]

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