

Roll No. ....

**OLE-3217**  
**B. Tech. 5th Semester (ECE)**  
**Examination – April, 2021**

**COMPUTER ORGANISATION AND ARCHITECTURE**

**Paper : PCC-ECE-303-G**

*Time : Three Hours ]*

*[ Maximum Marks : 75*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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**Note :** Attempt *five* question in all, selecting *one* question from each Section. Question No. 1 is *compulsory*.

**1.** Answer the following questions :  $2.5 \times 6 = 15$

- (a) What are the character codes ? Explain Gray code with example.
  
- (b) State the rule of floating point subtraction.

- (c) How many chips are needed to construct  $2\text{ M} \times 16$  memory system using  $512\text{ K} \times 8$  static memory chips ?
- (d) What is pipelining ? State phases of instruction pipeline.
- (e) An address space is specified by 24 bits and the corresponding memory space by 16 bits. So tell how many words are there in the virtual memory and in the main memory.
- (f) Distinguished between isolated mapped I/O and memory mapped I/O.

### **SECTION – A**

2. (a) Explain RTL with example. Write the control sequence for instructions Add R4, R5, R6. Also draw bus transfer between registers and memory.

8

- (b) What are codes ? Explain error correction and detection codes with examples.

7

3. (a) Explain the control sequence for an unbranched instruction, conditional and unconditional branch instruction with timing diagram. 8
- (b) What are the advantages and disadvantages of hardwired and microprogrammed control ? Explain hardwired control unit with diagram. 7

### SECTION – B

4. (a) What are instruction codes ? Explain instruction cycle with memory reference instruction. Draw the diagram of basic computer design to execute an instruction from memory. 8
- (b) How the instructions are processed in CPU ? Describe various register transfer instructions for data transfer & manipulation. Also draw diagram of register reference instruction cycle. 7
5. What are addressing modes ? Explain all modes with example. 15

## **SECTION – C**

6. (a) Explain pipeline processing with its advantages & disadvantages. Give example of 4 stage instruction pipeline execution. 10
- (b) Describe the techniques for handling control hazards in pipeline. 5
7. (a) What is parallel processing ? Explain vector processing with pipeline. 8
- (b) What are array processors ? Explain SIMD and Attached array processors. 7

## **SECTION – D**

8. (a) Explain various mapping techniques associated with cache memories. 8
- (b) What is interrupt ? Explain different types of interrupts and ways of handling interrupts. 7
9. (a) Write the working of peripheral components interconnection PCI bus. 8
- (b) Discuss DMA controller with diagram. 7