

**FEDERAL UNIVERSITY OF TECHNOLOGY OWERRI**  
**SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY**  
**DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING**

**Course Code:** EEE 311: Computer Organization and Architecture **Session:** 2018 / 2019

**Instruction:** Attempt all questions **Date:** 15/05/2019

**Time:** 44 min

**End of Semester Test**

**Question 1**

A certain ROM is capable of storing 16 KB of data. If the internal architecture of the ROM uses a square matrix of registers, determine (i) the number of registers in each row (ii) the number of registers in each column (iii) the total number of address inputs (iv) the type of row decoder and (v) the type of column decoder.

(b) Why do we need to have secondary storage devices when the computer already has a primary memory?

**Question 2**

(a) Differentiate between (i) fixed point and floating point number representation

(b) (i) Why is control unit needed inside the CPU? (ii) List 4 basic tasks of a control unit.

(c) List 5 main features of the 8085 microprocessor

(d) In tabular form, differentiate between Core i5, Core i7 and Core i9 processors.

**Question 3**

(a) (i) What is a multiprocessor? (ii) State two advantages of a multiprocessor system.

(b) Explain the Vonn Neumann stored program concept.

(c) (i) Define interfacing (ii) List 4 medium of interfacing in a computer memory.

(d) Explain 3 type of standard bus system for interface.

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Course Code: EEE 311: Computer Organization and Architecture

Session: 2018/2019

Instruction: Answer any 5 questions

Date: 26 / 06 / 2019

Time Allowed: 2 Hours

**Question 1**

- Differentiate between (i) Computer Organization and Architecture (ii) Explain the concept of Artificial Intelligence in relation to computer generation. (5mks)
- Explain the Vonn Neumann stored program concept (ii) With clear schematics explain Vonn Neumann digital computer architecture. (8mks)
- Why do we need to have secondary storage devices when the computer already has a primary storage? Distinguish between magnetic tape and magnetic disk as a secondary storage device (7mks)

**Question 2**

- Differentiate between a sequential access memory and random access memory (ii) Explain the following with schematic diagram (1) SMO (2) UMA (3) NUMA (4) COMA (9mks)
- What is a multiprocessor? (ii) State two advantages of a multiprocessor system. (3mks)
- In tabular form, differentiate between Intel Core i3, Core i5, Core i7 and Core i9 processors, which one is the best and why (8mks)

**Question 3**

- What do vendors mean when they talk about generation of chipsets (ii) Briefly explain Turbo boost, Hyper threading and Dual Core processor (iii) List 4 basic tasks of a control unit (8mks)
- Define interfacing (ii) Highlight 4 medium of interfacing in a computer memory. (5mks)
- (i) What is instruction set? (ii) List two classification of instruction set. (3mks) (ii) Subtract -64 from -32 using 2's complementary arithmetic. (4mks)

**Question 4**

- What is a microcontroller (ii) Highlight the differences between a microprocessor and a microcontroller with neat schematic diagram (5mks)
- State 7 features of the 8085 microprocessor (ii) List 4 applications of a microcontroller. (7mks)
- What is addressing mode? Discuss different modes of addressing in 8085 microprocessor. (8mks)

**SECTION B**

**Question 5**

- (i) State 4 types of primary memory in a computer system (ii) Why is control unit needed inside the CPU? (5mks)
- (i) What is cache memory? (ii) With a detail diagram, explain the concept of memory hierarchy. (8mks)
- Explain the difference between SRAM and DRAM with the aid of diagrams. (7mks)

**Question 6**

- (i) Define instruction format (ii) Differentiate between Opcode and Operand. (5mks)
- (i) Explain the two techniques of implementation of control unit of a CPU with neat schematics State 3 advantages and disadvantages of each technique (10mks)
- (i) Define parallel processing (ii) List 4 techniques of executing ILP in a microprocessor. (5mks)

**Question 7**

- List 2 popular standard methods of representing character in a computer system (ii) Explain parity check in relation to any of the standard. (5mks)
- What is DMA and why is it necessary? (ii) Explain the concept of microprocessor funneled data transfer techniques with clear schematics. (8mks)
- What are the functions of ALU? (ii) State the Arithmetic and Logical operations that can be performed by ALU. (7mks)