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266296
BCA(III) — 303

2019

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer **five** questions in which*

Q. No. 1 is compulsory.

1. Choose the correct alternative of the following :
 - (a) What is the high speed memory between the main memory and the CPU called ?
 - (i) Register memory
 - (ii) Cache memory
 - (iii) Storage memory
 - (iv) Virtual memory
 - (b) Which of the following is used in main memory ?
 - (i) SRAM

- (ii) DRAM
- (iii) PRAM
- (iv) DDR

(c) Components that provide internal storage to the CPU are :

- (i) Registers
- (ii) Program counters
- (iii) Controllers
- (iv) Internal chips

(d) CPU fetches the instruction from memory according to the value of :

- (i) Program counter
- (ii) Status register
- (iii) Instruction register
- (iv) Program status word

(e) Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called ?

- (i) Fragmentation

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(2)

Contd.

- (ii) Paging
- (iii) Mapping
- (iv) None of the above

(f) Which of the following is a universal gate ?

- (i) AND
- (ii) Ex-OR
- (iii) OR
- (iv) NAND

(g) Both CISC and RISC architectures have been developed to reduce the :

- (i) Cost
- (ii) Time delay
- (iii) Semantic gap
- (iv) All of the above

(h) Pipelining is a unique feature of :

- (i) RISC
- (ii) CISC
- (iii) ISA
- (iv) IANA

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(3)

(Turn over)

2. What do you mean by primary memory unit and secondary memory unit ? What are the key properties of semiconductor memory ? Explain.
 3. (a) Mention any two advantages and two limitations of magnetic tape for storage of digital information.
(b) Define the term track, cylinder and sector.
 4. What is an operating system ? List and briefly define the major types of operating system scheduling.
 5. What do you mean by Machine instruction characteristics ? Explain elements of a machine instruction.
 6. What do you mean by CISC and RISC ? Describe the difference between CISC and RISC Architecture.
 7. Describe the essential characteristics of the super-seals approach to processor design.
8. (a) Construct a truth-table for the following Boolean expression :
(i) $ABC + \bar{A}\bar{B}\bar{C}$
(ii) $ABC + A\bar{B}\bar{C} + \bar{A}B\bar{C}$
(iii) $A(\bar{B}\bar{C} + \bar{B}C)$
(iv) $(A + B)(A + C)(\bar{A} + \bar{B})$
(b) Convert the following :
(i) 000011 and 011100 to decimal number
(ii) 64 and 145 to binary number
 9. Write short notes on any four the following :
(a) History of computer
(b) I/O modules
(c) Memory management
(d) Types of operands
(e) Micro operations
(f) Optical memory

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(4)

Contd.

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2017

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Answer five questions in which

Q. No. 1 is compulsory.

1. Choose the correct alternative of the following :

(a) Computer building blocks consists of :

- (i) Memory, ALU, CU, input and output**
- (ii) I/O controllers, CPU, I/O devices**
- (iii) Memory, Cache, Register**
- (iv) Hardware, Software, Fireware**

(b) Overflow occurs when :

- (i) Data is out of range**
- (ii) Data is within range**

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(Turn over)

- (iii) Smaller than range
- (iv) None of these
- (c) Subtractor can be implemented by :
 - (i) Adder
 - (ii) Complementor
 - (iii) Both (i) and (ii)
 - (iv) None of the above
- (d) The principle of locality justifies the use of :
 - (i) Interrupts
 - (ii) Polling
 - (iii) DMA
 - (iv) Cache memory
- (e) Physical memory broken down into groups of equal size is called :
 - (i) Page
 - (ii) Tag
 - (iii) Block
 - (iv) Index
- (f) Basic shift operation are :
 - (i) Local shift
 - (ii) Circular shift
 - (iii) Arithmetic shift
 - (iv) All of the above

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(2)

Contd.

- (g) Operand fetching of an instruction is done in :
 - (i) Fetch cycle
 - (ii) Decode cycle
 - (iii) Memory write cycle
 - (iv) Execution cycle
- (h) The addressing mode specified in an instruction is determined by :
 - (i) Memory
 - (ii) Control Unit
 - (iii) ALU
 - (iv) All of these
- (i) An I/O driver is a :
 - (i) Hardware Circuit
 - (ii) Software Programme
 - (iii) Both (i) and (ii)
 - (iv) None of the above
- (j) Interrupts servicing is a joint effort of :
 - (i) CPU and Memory
 - (ii) Hardware and software
 - (iii) CPU and device
 - (iv) None of these

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(3)

(Turn over)

2. What do you mean by addressing modes? Discuss the different addressing modes?
3. Explain the organisation of cache memory system. Also, explain the cache Mapping instructions. Also, explain the techniques of addressing modes.
4. Describe the structure and functions of I/O transfer data from peripherals.
5. What do you mean by virtual memory? Discuss how paging helps in implementing virtual memory.
6. (a) What is instruction cycle? Explain with diagram.
(b) Explain the types of parallel processor system and organization of multiprocessor system.
7. Describe the register organisation in CPU.
8. Describe the types of parallel processor system and organization of multiprocessor system.

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(4)

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2017

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Answer five questions in which

Q. No. 1 is compulsory.

1. Select the one correct answer of the following:

- (a) The language computer understands without translation is called:
 - (i) A high level language
 - (ii) An assembly language
 - (iii) A command language
 - (iv) Machine language
- (b) An instruction cycle is:
 - (i) Fetch-decode-execution
 - (ii) Decode-fetch-execution

(Turn over)

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- (iii) Fetch-execution-decode
- (iv) Execution-decode-fetch
- (c) (FAFAFA)₁₆ into octal form becomes :
 - (i) 76 76 76 76
 - (ii) 76 73 76 72
 - ☒ (iii) 76 57 53 72
 - (iv) 76 72 76 72
- (d) The technique of placing software in a ROM semiconductor chip is called :
 - (i) PROM
 - (ii) EPROM
 - ☒ (iii) FIRMWARE
 - (iv) MICRO-PROCESSING
- (e) For data transfer, the DMA controller needs :
 - (i) Address of the device and I/O command
 - (ii) The starting location in Memory to read from or write to
 - ☒ (iii) The number of bytes to be read or write
 - ☒ (iv) All of these

- (f) If the size of MAR in a system is of 10 bits and that of MDR is 32 bits, what would be the size of the physical primary memory ?
 - (i) 2048 × 16 bits
 - (ii) 1 k bytes
 - (iii) 4096 × 8 bits
 - ☒ (iv) 1024 × 32 bits
- (g) A set of flip-flops can be used to make :
 - ☒ (i) Register
 - (ii) RAM
 - (iii) PMOS
 - ☒ (iv) ROM
- (h) An array processor falls in the Flynn's classification of :
 - (i) SISD
 - ☒ (ii) SIMD
 - (iii) MISD
 - (iv) MIMD
- 2. (a) Describe the Von-Neumann architecture as used in building a digital computer.
- (b) Explain Flynn's classification.

3. What are the main features of Booth's algorithm ?
Explain the multiplication process with the help of a flow chart.

4. Draw and explain micro program. control unit.

5. What are the different types of interrupt ? How is interrupt I/O different from programmed I/O ?

6. What is meant by bus arbitration ? Explain the purpose of widely used bus standard.

7. What is the difference between :

- (a) Arithmetic pipeline and Instruction Pipeline.
- (b) RISC and CISC computers

8. What is the instruction hazard ? Explain the methods for dealing with instruction hazard.

9. Write short notes on any **four** of the following :

- (a) USB
- (b) Fire Wire Protocol
- (c) Hamming Codes
- (d) Virtual Memory
- (e) RAID Technology
- (f) Cache Memory

