

2015

(2nd Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-203 (OC)

(Introduction to Computer Architecture and Organization)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Express the following Boolean functions and draw a K-map : 5+5=10
 (i) $F = A + B'C$ in a sum of minterm form
 (ii) $F = AB + A'C$ in a product maxterm form

Or

- (b) Write a note on Don't-care conditions. Simplify the Boolean function

$$F(w, x, y, z) = \Sigma(1, 3, 7, 11, 15)$$

and the Don't-care conditions

$$d(w, x, y, z) = \Sigma(0, 2, 5) \quad 5+5=10$$

- 2.** (a) Discuss the different types of CPU instruction with examples. 6
- (b) Distinguish between the following : 2+2=4
- (i) Instruction cycle and machine cycle
 - (ii) Three-address instructions and zero-address instruction
- Or
Additional Question of Computer Application
and Organization*
- (c) Write short notes on the following : 2+2+2=6
- (i) Pipelining
 - (ii) Registers
 - (iii) Operand
- (d) What is a process? How are multi-processing and multithreading different? 4
- 3.** (a) How do synchronous and asynchronous data transfer differ from each other? Discuss the different methods/ techniques of data transfer. 2+8=10
- Or*
- (b) Explain the following : 5+5=10
- (i) DMA
 - (ii) Input-output processor
- 4.** (a) What is memory hierarchy? Explain its significance. 2+3=5
- (b) Write a note on virtual memory highlighting its importance. 5

(3)

Or

- (c) What is cache memory? Compare and contrast between associative mapping and direct mapping of each memory. 10
5. (a) What do you understand by directives? Briefly explain the different directives supported by 8086. 6
- (b) Differentiate between COM and EXE programs. 4
- Or
- (c) Write short notes on the following : 2+2+2=6
- (i) Linker
 - (ii) Assembler
 - (iii) Loader
- (d) What are interrupts? Explain the interrupts in 8086 microprocessor. 4

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(2nd Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-203 (OC)

**(Introduction to Computer Architecture
and Organization)**

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

- I.** Put a Tick (\checkmark) mark against the correct answer in the brackets provided : $1 \times 10 = 10$

1. *T* flip-flop can be obtained from

(a) *S-R* flip-flop ()

(b) *J-K* flip-flop ()

(c) *D* flip-flop ()

(d) All of the above ()

2. A very high-speed memory used to increase the speed of processing is called

(a) virtual memory ()

(b) RAM ()

(c) cache memory ()

(d) ROM ()

3. Which of the following is not an auxiliary memory?

(a) CD-ROM ()

(b) Magnetic tapes ()

(c) ROM ()

(d) Optical disks ()

(3)

4. Which of the following is a single-input gate?

(a) AND ()

(b) NAND ()

(c) NOR ()

(d) NOT ()

5. The number of select input lines in a 4-to-1 multiplexer is

(a) 1 ()

(b) 2 ()

(c) 3 ()

(d) 4 ()

6. Which of the following memory units stores bootstrap loader?

(a) RAM ()

(b) ROM ()

(c) Cache memory ()

(d) Virtual memory ()

7. The number of bits required to address a memory of 1024 bytes is

(a) 10 ()

(b) 100 ()

(c) 2^2 ()

(d) 2^{10} ()

(5)

8. The types of counter where the common clock input is connected to all the flip-flops and are therefore clocked simultaneously are called

(a) asynchronous counters ()

(b) synchronous counters ()

(c) ring counters ()

(d) ripple counters ()

9. Ten characters per second with an 11-bit format has a transfer rate of

(a) 11 baud ()

(b) 110 baud ()

(c) 1100 baud ()

(d) None of the above ()

10. Which of the following provides a method for transferring between internal storage and external storage I/O devices?

(a) I/O interface ()

(b) I/O processor ()

(c) I/O command ()

(d) None of the above ()

II. State whether the following statements are *True (T)* or *False (F)* by a Tick (\checkmark) mark : $1 \times 5 = 5$

1. A full adder is a combinational circuit that forms the arithmetic sum of two binary digits.

(T / F)

2. Pipelining is a technique of decomposing a sequential process into microoperation.

(T / F)

(7)

3. Data communication processor is the processor that communicates with remote terminals over telephone wires and other communication media.

(T / F)

4. RAM is used for storing programs that are permanently resident in the computer.

(T / F)

5. The ORG direction allows you to set the instruction counter to a desired value at any points in the program.

(T / F)

III. Answer the following questions :

2×5=10

1. What is the difference between counters and registers?

(a) I/O interface
 (b) RAM

(b) I/O processor

(c) ROM
 (d) Cache memory

(e) None of the above

II. State whether the following statements are True (T) or False (F) mark (✓) in front of each statement.

(F) A full adder is a combinational circuit that forms the sum and sum of two binary digits.

(T) A technique of compressing a file into smaller size is called compression.

(F) A technique of decompressing a compressed file into its original form is called decompression.

(9)

2. What are universal gates? Why are they called so?

(10)

3. What do you mean by three-state bus buffers?

4. Define vectored interrupt and non-vectored interrupt.

* * *

(12)

b 5. Write the function of bootstrap loader.

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