

**CR-5602**

**B. C. A. (First Year) Examination, March-April 2019**

**(Group-I)**

**Paper : BCA-12**

**DIGITAL ELECTRONICS**

**Time Allowed : Three hours**

**Maximum Marks : 40**

**Note :** All sections as directed. All questions carry equal marks.

**Section-'A'**

**(Objective Type questions)**

**5×1=5**

**Note :** Attempt all questions. Each question carries 1 mark.

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**PTO**

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**1. Choose the correct answer :**

(i) What is the radix of a binary number system?

(a) 4

(b) 8

☒ (c) 2

(d) 10

(ii) Which of the following logical operations is represented by the  $\oplus$  sign in Boolean algebra?

(a) Inversion

(b) AND

(c) OR

☒ (d) Complementation

(iii) What is the hold condition of a flip-flop?

☒ (a) Both S and R inputs activated

(b) No active S or R input

(c) Only S is active

(d) Only R is active

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- (iv) In memory-mapped scheme, the devices are viewed as :
- (a) Distinct I/O devices
  - ☒ (b) Memory locations
  - (c) Only input devices
  - (d) Only output devices
- (v) What is the maximum time required before a dynamic RAM must be refreshed?
- ☒ (a) 2 ms
  - (b) 4 ms
  - (c) 8 ms
  - (d) 10 ms

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### Section-'B'

(Short Answer Type Questions) 5×2=10

*Note : Attempt all questions. One question from each unit is compulsory. Each question carries 2 marks.*

#### Unit-I

2. (i) Convert 0.85 to its binary equivalent.  
(ii) Convert 2F59 to its equivalent decimal number.

Or

What is 2's complement representation? What are its advantages over the other number systems?

#### Unit-II

3. What do you mean by Binary Fixed-Point representation?

Or

Show the following expression as product of sums. Depict the K-map for both as sum of products and product of sums with corresponding gates to realise the function

$$F = \overline{A}\overline{C} + B\overline{C}$$

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**Unit-III**

4. What is T-type Flip-Flop? Explain.

**Or**

What do you mean by program control?

**Unit-IV**

5. What is synchronous data transfer?

**Or**

Write short note on isolated versus memory mapped I/O.

**Unit-V**

6. What do you mean by Page Replacement?

**Or**

Write short note on writing into cache.

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**Section-'C'**

**(Long Answer Type Questions) 5×5=25**

*Note : Attempt all questions. One question from each unit is compulsory. Each question carries 5 marks.*

**Unit-I**

7. Convert the following Hexadecimal number to Binary and then to Octal.

(i) 2BAFC

(ii) 67DEF

(iii) 2567C

(iv) 2AB76

**Or**

Describe the Gray Code. What are characteristics of gray code with example?

**Unit-II**

8. Explain using diagram how NOR and NAND gates are universal gate?

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Or

Explain two and three variable Karnaugh map using example.

#### Unit-III

9. Explain Half and Full adder with the help of logic circuit diagram.

Or

Draw the logic diagram and explain the 16 to 1 multiplexer circuit.

#### Unit-IV

10. Write the some properties of simple I/O devices and controller.

Or

Explain in detail Handshaking.

#### Unit-V

11. Write short notes on : (any three)

- (i) Magnetic Drum
- (ii) Semiconductor memories

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(iii) Page table

(iv) Memory Hierarchy

(v) Mapping Techniques

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