

# AE-1314

B.C.A. New Course (Part - II)  
Term End Examination, 2016-17

# DIGITAL ELECTRONICS AND MICROPROCESSOR

Paper - BCAYT 202

*Time : Three Hours]                      [Maximum Marks : 100*  
*[Minimum Pass Marks : 33*

**Note** : Answer **all** questions. Question No. 1 is compulsory. The figures in the right-hand margin indicate marks.

1. [A] Choose the correct answer : 1×20
- (a) The NAND gate output will be low if the inputs are :
- (i) 00                      (ii) 01
- (iii) 10                     (iv) 11
- (b) The simplification of boolean expression  $\overline{\overline{ABC}} + \overline{\overline{ABC}}$  is :
- (i) 0                         (ii) 1
- (iii) A                        (iv) BC

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- (c) The number of control lines for a  $8 \times 1$  multiplexer is :
- (i) 2                      (ii) 3
  - (iii) 4                    (iv) 5
- (d) EPROM contents can be erased by exposing it to :
- (i) Ultraviolet rays
  - (ii) Infrared rays
  - (iii) Microwaves
  - (iv) Head radiation
- (e) The hexadecimal number 'AO' has the decimal value equivalent to :
- (i) 80                      (ii) 256
  - (iii) 100                    (iv) 160
- (f) The digital logic family which has minimum power dissipation is :
- (i) TTL                    (ii) RTL
  - (iii) DTL                    (iv) CMOS
- (g) -8 is equal to signed binary number :
- (i) 10001000              (ii) 00001000
  - (iii) 10000000            (iv) 11000000
- (h) In JK flip flop toggle means :
- (i)  $Q = 1$  and  $\overline{Q} = 0$
  - (ii)  $Q = 0$  and  $\overline{Q} = 1$
  - (iii) Change the output to opposite state
  - (iv) No change in output

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(i) The excess 3 code of decimal number 26 is :

- (i) 01001001      (ii) 01011001  
(iii) 10001001      (iv) 00011101

(j) How many AND gates are required to realise  $Y = CD + EF + G$  ?

- (i) 4                      (ii) 5  
(iii) 3                    (iv) 2

[B] Fill in the blanks : 1×5

- (a) The octal equivalent of  $(247)_{10}$  is ..... .  
(b) Number of flip flops required to construct mod 30 counter is ..... .  
(c)  $xy' + y'x$  is output function of ..... gate.  
(d) The 2's complement of the number 1101110 is ..... .  
(e) BCD code of decimal number or (no.) 25 is ..... .

### Unit-I

2. (a) Subtract the following : 15  
(i)  $110010 - 1100$  (using 1's complement)  
(ii)  $11100 - 10101010$  (using 2's complement)  
(b) Explain exclusive NOR gate.

**OR**

Convert the following :

- (a)  $(11001100)_2 = ( )_6$   
(b)  $(453)_8 = ( )_2$   
(c)  $(101010010101)_2 = ( )_8$

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**Unit-II**

3. Explain diode and transistor. 15

**OR**

Explain RTL, DTL and TTL logic families.

**Unit-III**

4. Simplify the following using K map : 15

$$F(A, B, C, D) = \sum (0, 2, 4, 6, 7, 11, 14, 15) \\ + \sum (1, 5, 8)$$

**OR**

Prove the following boolean identities :

(a)  $XY + YZ + \overline{Y}Z = XY + Z$

(b)  $AB + \overline{A}B + \overline{A}\overline{B} = \overline{A} + B$

**Unit-IV**

5. Design 2-bit digital comparator. 15

**OR**

What is ripple counter design of 3-bit ripple counter ?

**Unit-V**

6. Explain machine cycle and instruction cycle of Microprocessor. 15

**OR**

Draw pin diagram of intel 8085 processor and also write its pin functions.