

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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(2)

- (c) The number of control lines for a 8×1 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 $\bar{Q} = 0$
 - (ii) $Q = 0$ and $\bar{Q} = 1$
 - (iii) Change the output to opposite state
 - (iv) No change in output

(3)

- (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) $(101010010101)_2 = ()_8$

(4)

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) $XY + YZ + \bar{Y}Z = XY + Z$

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

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.