

DAY - **22**

SEAT NUMBER

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2026

III

10

1100

V - 767

(E)

ELECTRONICS
PAPER - II (C-2)

Time : 3 Hours**4 Pages****Max. Marks : 50**

- Instructions :*
- (1) All questions are compulsory.
 - (2) Draw neat labelled diagrams wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Use of log table is allowed.

1. (A) Select correct alternatives from the following sub-questions and rewrite the complete sentences :

(a) In any logic family when speed of operation is increased the total amount of power dissipated in it _____.

1

- (i) Increases
- (ii) Decreases
- (iii) Does not change
- (iv) Zero

(b) 1:64 Demultiplexer can be designed with _____ select lines.

1

- (i) 4
- (ii) 5
- (iii) 6
- (iv) 3

(c) In _____ A/D converter for high resolution system many comparators are necessary.

1

- (i) Counter type
- (ii) Successive approximation type
- (iii) R-2R ladder type
- (iv) Simultaneous type

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[P.T.O.]

(d) To produce graphical images _____ device is used.

1

- (i) OMR
- (ii) COM
- (iii) Plotter
- (iv) OCR

(B) Attempt **any two** of the following :

- (a) With suitable example explain Hexadecimal to Decimal Conversion. 3
- (b) Define : (i) Power dissipation, (ii) Fan-in, Fan-out, (iii) Noise margin. 3
- (c) Explain the working of Master-slave JK Flip-flop. Draw suitable diagram. 3

2. (A) Attempt **any two** of the following :

- (a) Solve : 3
 - (i) $(1110)_2 - (0101)_2 = (?)_2$
 - (ii) $(1101)_2 + (1011)_2 = (?)_2$
 - (iii) $(11010)_2 - (1010)_2 = (?)_2$
- (b) Draw and explain basic circuit of CMOS Inverter. 3
- (c) Draw the diagram of 4-bit right shift register using D-flip-flop and explain its working. 3

(B) Attempt **any one** of the following :

- (a) State and prove Demorgans theorems. Draw logic diagram and truth table. 4
- (b) Draw logic diagram of 4:1 Multiplexer using logic gates and explain it with truth table. <https://www.maharashtrastudy.com> 4

3. (A) Attempt **any two** of the following :

- (a) Draw and explain basic circuit of TTL NOR gate. 3
- (b) Implement the expression
 $f(A,B,C) = \sum m(2, 5, 4, 7)$ Using multiplexer. 3
- (c) Explain the working of counter type Analog to Digital Converter. 3

(B) Attempt **any one** of the following :

- (a) Draw the logic diagram of 3-bit Synchronous Counter and explain its working. 4
- (b) Draw block diagram of Digital Computer and explain function of each block. 4

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- 4 (A) Attempt **any two** of the following
- (a) Explain 1's complement and 2's complement with suitable examples. 3
 - (b) Explain NAND and NOR gates in brief 3
 - (c) Explain the working of clocked RS Flip-flop using NAND gates 3
- (B) Attempt **any one** of the following
- (a) Explain 1:4 Demultiplexer. Draw logic diagram, truth table. Give one application of Demultiplexer. 4
 - (b) Explain the working of R-2R ladder type Digital to Analog Converter. 4
- 5 (A) Attempt **any two** of the following
- (a) Explain Hexadecimal number system. Convert Hexadecimal number into binary 3
 - (i) $(AB9)_{16} = (?)_2$
 - (b) Implement the following expressions using Demultiplexer having active low outputs 3
 - (i) $f_1 = \sum m(1, 3, 5, 7)$
 - (ii) $f_2 = \sum m(2, 4, 6)$
 - (c) Explain : (i) RAM, (ii) EPROM, (iii) EEPROM 3
- (B) Attempt **any one** of the following
- (a) Prove using Boolean Laws : 4
 - (i) $\overline{A \oplus B} = A \cdot B + \bar{A} \cdot \bar{B}$
 - (ii) $A + \bar{A}B = A + B$
 - (b) What is Modulus of counter ? How many Flip-flops are required to construct each of following counter : 4
 - (i) Mod - 8
 - (ii) Mod - 16
 - (iii) Mod - 32

OR

- 5 (A) Attempt any two of the following :
- (a) What are different number systems ? Give Radix for various number system. 3
 - (b) Explain Half adder with logic diagram and truth table. 3
 - (c) Explain the working of clocked D Flip-flop with logic diagram and truth table. 3
- (B) Attempt any one of the following :
- (a) What is Decoder ? Explain the working of BCD to Decimal decoder using gates 4
 - (b) Explain the working of Weighted Resister type Digital to Analog Converter. Write its disadvantages. 4
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