## PSG COLLEGE OF ARTS & SCIENCE
### (AUTONOMOUS)

### BSc DEGREE EXAMINATION MAY 2024
(Third Semester)

### Branch – ELECTRONICS

## DIGITAL ELECTRONICS/ DIGITAL PRINCIPLES & APPLICATIONS

Time: Three Hours                                             Maximum: 50 Marks

### SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks              (5 x 1 = 5)

1. The decimal value of $(1000)_2$ is _____
   i)1000          ii)8          iii)101          iv)16

2. The given Boolean expression is $Y = A\bar{B} + \bar{A}B$; if A = 1 and B = 1, then Y = _____.
   i)1          ii)0          iii)1 and 0          iv)None

3. A Demultiplexer can be used to realize a _____.
   i)Counter                        ii)Shift register
   iii)Combinational circuit        iv)Display system

4. Master-Slave configuration is used in flip-flops to _____.
   i)Increase its clocking rate          ii)Reduce power dissipation
   iii)Elimination race-around condition   iv)Improve its reliability

5. The main advantage of the successive – approximation method is _____.
   i)Speed                    ii)Accuracy
   iii)Resolution             iv)None of these

### SECTION - B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks              (5 x 3 = 15)

6. a    Explain 1's and 2's complement.
        OR
   b    Explain the procedure for BCD addition.

7. a    Analyze the term Pair, Quad and Octet in k-map with examples.
        OR
   b    State and prove Demorgan's theorems.

8. a    Draw the circuit and explain 4 bit parallel binary adder.
        OR
   b    Explain the multiplexer with neat diagram.

9. a    What is racing in J-K flip flop? Explain.
        OR
   b    What are shift-register? Give its uses.

10. a   Explain the operation of a 4-bit binary ladder with necessary circuit.
        OR
    b   Explain the principle of A/D converter.

## SECTION -C (30 Marks)
Answer **ALL** questions
**ALL** questions carry **EQUAL** Marks          (5 x 6 = 30)

11 a  Convert the following hexadecimal numbers to decimal
  i)  $(E9)_{16}$
  ii)  $(3FC.8)_{16}$
  iii)  $(FFFF)_{16}$

OR

  b  Discuss about the excess – 3 code and explain.

12 a  What is an XOR gate? Write its truth table and realize it using AND, OR and NOT gates.

OR

  b  Simplify using karnaugh map
  $Y = F(A,B,C,D) = \sum(0,1,2,4,5,10,11,14,15)$

13 a  Construct half adder and full adder circuits and draw their truth tables.

OR

  b  Explain the function of encoders with neat diagrams.

14 a  Explain RS flip-flop and SR flip flop using NOR gates.

OR

  b  Explain about the operation of Up/Down counter.

15 a  Explain about resistive divider type of D/A converter.

OR

  b  Explain about dual slope A/D converter.

Z-Z-Z          END