DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE – APRIL -2021.

DIGITAL CIRCUITS

(Maximum Marks : 75)   [Time : 2.15 hours]

PART–A

Marks

I. Answer **any three** questions in one or two sentences. Each question carries 2 marks.

1. Define 2's complement of a number with example.
2. State De-Morgan's Theorem.
3. Define Combinational logic.
4. Name the asynchronous inputs of a Flip-Flop.
5. List the various display in digital meter.   (3x2=6)

PART - B

II   Answer **any four** of the following questions . Each question carries 6 marks.

1. Convert
   (i) 100_{10} to   (____)$_2$
   (ii) $25D_{16}$ to   (____)$_2$
   (iii) 01000111_2 to   (____)$_{16}$
2. What is a half adder. Give its truth table. Realize it using any gates.
3. Explain the operation of D flip flop with logic diagram and truth table.
4. Define the terms Resolution and Sensitivity of DAC.
5. Reduce the expression F=A+AB+ ABC+ ABCD.
6. Draw the circuit of 4 bit asynchronous Up counter using JK Flip Flop along
   with its truth table.
7. Compare RAM and ROM.   [4x6 =24]

PART - C

(Answer **any of the three units** from the following. Each full question carries 15 marks)

UNIT I

III (a) Draw the logic diagram and truth table of two input NOR gate and EXOR gate.   (6)

(b) Solve the following.

    (i) 1000+1010   (ii)11001-1100   (iii)1.01 x10.1   (9)

OR

IV (a) Simplify Boolean function $F(A,B,C,D) = \sum_m (1,2,3,5,6,7,8.10,13,15)$ (9)

   (b) Compare weighted and non-weighted code.   (6)

UNIT- II

V (a) Draw the circuit and explain the working of TTL NAND gate.   (7)

   (b) Define the terms (i) Propagation delay   (ii)Noise Margin
            (iii) Fan out   (iv) Fan in   (8)

OR

VI (a) Explain the working of a 4-to-1 multiplexer. Write its truth table and
      sketch its logic diagram.   (8)

   (b) Describe the operation of 1 bit comparator circuit.   (7)

UNIT- III

VII (a) Explain the operations of Serial in Parallel out shift register with neat
      sketch.   (8)

   (b) Draw the circuit of Decade counter and give its truth table.   (7)

OR

VIII (a) Draw and explain the operation of Master Slave J K Flip Flop with

      its truth table.   (9)

   (b) Compare asynchronous and Synchronous counter.   (6)

UNIT – IV

IX (a) Explain the working of Successive Type ADC with neat sketch.   (8)

   (b) Explain the various types of ROM.   (7)

OR

X (a) Explain the operation of R-2R ladder type DAC converter with neat sketch. (10)

   (b) List the specifications of digital meter display.   (5)

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