

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2020**

**DIGITAL ELECTRONICS AND MICROPROCESSORS**

[Maximum Marks: 75]

[Time: 2.15 Hours]

**PART-A**

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

- I. 1. Draw the symbols of two input NAND and NOR gate.  
2. Give the decimal equivalents for each of the following binary numbers.  
(a) 110101 (b) 11001.001  
3. Define a flip flop. Draw the symbol of positive edge triggered RS – Flip flop.  
4. List the need of a register.  
5. Define the term microprocessor. (3 x 2 = 6)

**PART-B**

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

- II 1. Convert the hexadecimal number (AF8C.2B)<sub>16</sub> to decimal number. Show the steps.  
2. Prove the universality of NAND gate.  
3. State and explain De-Morgan's theorem.  
4. List the application of flip flop.  
5. Differentiate between combinational and sequential circuits.  
6. Explain the need for ADC and DAC converters.  
7. Explain the special purpose registers used in 8085. (4 x 6 = 24)

**PART-C**

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

**UNIT – I**

- III (a) Convert the decimal number 250.5 to its binary and hexadecimal equivalent. (7)  
(b) Derive the EX-OR gate from universal gates and draw its symbol and truth table. (8)

**OR**

- IV (a) Draw the logic implementation of following output expression using basic gates.  
 $Y = \bar{A} + B(C+D)$  (7)
- (b) What is 1's complement and 2's complement of a binary number. Write the 1's and 2's complement of 1010101. (8)

**UNIT - II**

- V (a) Write the canonical sum of product form of the function  $Y = AB + ACD$ . (7)
- (b) Draw the logic diagram of a Master Slave JK flip flop and explain its operation with Truth table. (8)

**OR**

- VI (a) Minimize the following expression using K-map.  $F(A,B,C) = \sum(1,2,3,5,7)$ . (7)
- (b) Draw the logic circuits and give truth table for the following. (8)
- (a) Half adder (b) Half subtractor

**UNIT- III**

- VII (a) Draw the schematic diagram of a 4-bit Parallel IN – Parallel OUT shift register using negative edge triggered D-Flip flop and explain how a data 1101 is stored. (7)
- (b) Explain any two types of A/D converter. (8)

**OR**

- VIII (a) Explain the concept of R-2R ladder network for D/A conversion. (7)
- (b) Explain the operation of a 4-bit synchronous counter. Also draw its timing diagram. (8)

**UNIT - IV**

- IX (a) Explain different buses used in 8085 microprocessor. (7)
- (b) Draw the internal architecture of 8085 microprocessor and label it. (8)

**OR**

- X (a) Explain the addressing modes of 8085 microprocessor. (7)
- (b) Draw the schematic pin diagram of 8085 microprocessor. (8)

-----