

DiplETE – ET/CS (Current & New Scheme)

Time: 3 Hours

JUNE 2016

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

- How many bits are there in one byte?
(A) 2 (B) 4
(C) 8 (D) 10
- The decimal equivalent of $(567)_8$ is
(A) 456 (B) 887
(C) 375 (D) 501
- The BCD equivalent of decimal number 32 is
(A) 00110010 (B) 10110010
(C) 00111010 (D) 10001100
- The number of input variables which a NOT gate can have is
(A) One (B) Two
(C) Three (D) Any number
- An XOR logic gate will have output as 1
(A) When all Inputs are 1
(B) When odd numbers of Inputs are 1
(C) When even numbers of Inputs are 1
(D) When even numbers of Inputs are 0
- RS flip flop has active Input as
(A) Low (B) High
(C) Both (A) & (B) (D) None of these
- A delay flip flop is also called
(A) TFF (B) JKFF
(C) DFF (D) RSFF
- Schmitt trigger can be used as a
(A) flip flop (B) Comparator
(C) Square wave generator (D) All of these
- Which of the following is used as a data selector?
(A) Encoder (B) Decoder
(C) Multiplexer (D) DeMux

- j. ALU carries out
 (A) Arithmetic operations (B) Logic operations
 (C) Both (A) and (B) (D) None of these

**Answer any FIVE Questions out of EIGHT Questions.
 Each question carries 16 marks.**

- Q.2** a. What are advantages of Digital system over Analog system? (4)
 b. What is Quantization? (2)
 c. Perform the following conversions: (10)
 (i) $(A6)_{16} = (?)_2$ (ii) $(29)_{10} = (?)_2$
 (iii) $(245)_{10} = (?)_{BCD}$ (iv) $(B5A)_{16} = (?)_{10}$
 (v) $(1573)_8 = (?)_{10}$
- Q.3** a. What are special characteristics of NOR and NAND gates? Explain. (6)
 b. Define DE-MORGAN's Theorems. (4)
 c. Minimize the following function using K-map (6)
 $f(x_3, x_2, x_1, x_0) = \Sigma m(1, 3, 5, 7, 8, 9, 10, 11, 13, 15)$
- Q.4** a. Distinguish between a half-adder and a Full adder. (6)
 b. Explain the working of BCD adder. (6)
 c. Add the following binary numbers (2)
 101010 and 110110
 d. Subtract 10101 from 11011. (2)
- Q.5** a. Distinguish between combinational and sequential logic circuits. (4)
 b. Draw the circuit diagram of a positive edge triggered JK flip flop and explain its operation with the help of a truth table. (9)
 c. Discuss the application of flip flops. (3)
- Q.6** a. What is counter? (2)
 b. Design a Two-bit Ripple up counter using positive Edge triggered FF. (8)
 c. How you will cascade Ripple Counters? Explain. (6)
- Q.7** a. Write a note on BCD to 7-segment decoders. (6)
 b. Discuss in detail, Four Input Multiplexer Circuit. (6)
 c. Design a 10 to 4 line Encoder Circuit. (4)
- Q.8** a. Explain what do you understand by a Register? What is buffer register? (6)
 b. Explain in detail Serial In Serial Out shift register. (8)
 c. What are applications of Shift Registers? (2)
- Q.9** a. What is memory? (2)
 b. What do you mean by word? (2)
 c. Distinguish between Dynamic and Static memory. (6)
 d. How RAM and ROM are classified? (4)
 e. Where are SRAMs preferred? (2)