

Roll No:

Total No. of Questions : 09]

[Total No. of Pages :03

Paper ID [A0453]

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B. Tech. (Sem. - 3rd)

DIGITAL CIRCUITS & LOGIC DESIGN (CS - 205)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 × 2 = 20)

- a) The decimal equivalent of Binary number 11010 is
(A) 26 (B) 36
(C) 16 (D) 23
- b) 1's complement representation of decimal number of -17 by using 5 bit representation is
(A) 1110 1110 (B) 11011101,
(C) 1100 1100 (D) 0001 0001
- c) The excess 3 code of decimal number 26 is
(A) 0100 1001 (B) 01011001
(C) 1000 1001 (D) 01001101
- d) How many AND gates are required to realize $Y = CD + EF + G$
(A) 4 (B) 5
(C) 3 (D) 2
- e) How many select lines will a 16 to 1 multiplexer will have
(A) 4 (B) 3
(C) 5 (D) 1.

- f) How many flip flops are required to construct a decade counter
- (A) 10 (B) 3
 (C) 4 (D) 2
- g) Which TTL logic gate is used for wired ANDing
- (A) Open collector output (B) Totem Pole
 (C) Tri state output (D) ECL gates
- h) CMOS circuits consume power
- (A) Equal to TTL (B) Less than TTL
 (C) Twice of TTL (D) Thrice of TTL
- i) IC 7490 contains flip flops
- (A) 4 (B) 3
 (C) 2 (D) 10
- j) In a RAM, information can be stored
- (A) By the user, number of times.
 (B) By the user, only once.
 (C) By the manufacturer, a number of times.
 (D) By the manufacturer only once.

Section - B

(4 × 5 = 20)

- Q2)** (a) Convert decimal 177.25 to octal number.
 (b) Perform following subtraction
- (i) 11001-10110 using 1's complement.
 (ii) 11011-11001 using 2's complement.
- Q3)** (a) Reduce the following equation using k-map
- $$Y = \overline{A}BC + A\overline{C}D + A\overline{B} + ABCD + \overline{A}BC$$
- (b) Write the expression for Boolean function
 $F(A,B,C) = \sum m(1, 4, 5, 6, 7)$ in standard POS form.

Q4) Explain working of three state TTL.

Q5) What do you mean by interfacing? Explain its need. How will you interface TTL to CMOS?

- Q6)** (a) Implement the following function using a 3 line to 5 line decoder
 $S(A, B, C) = \sum m(1, 2, 4, 7)$
 $C(A, B, C) = \sum m(3, 5, 6, 7)$.
(b) How will you form an 5 bit adder using 2 four bit adder IC's 7453.

Section - C

(2 × 10 = 20)

- Q7)** (a) Explain the operation of octal to binary encoder.
(b) Explain the working of master slave JK flip flop.
- Q8)** (a) Explain how parallel In Serial Out (PISO) shift register works.
(b) Design a mod-6 up counter.
- Q9)** (a) Explain how EPROM memory cell works.
(b) Explain the working of dual slope A/D converter.

