

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

May-24-0381

EC-302 (Digital Electronics)

[ECE, EE, EEE, CSE, IT]

B.Tech. 3rd (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, by selecting one question each from of sections A, B, C, D and Question 9 which is compulsory.

SECTION - A

- (a) If $A=1101.101$ and $B=1011.01$ (both in binary) find
(i) $A + B$ (ii) $A-B$ (using 2's complement method). (5)
(b) Discuss the use of BCD, 8421, Excess-3, Gray codes. (5)
- (a) Explain, with example, various error detection and correction codes. (5)
(b) Discuss the applications of the following logic gates: Tristate Logic (TSL), Schmitt Totem pole output and open collector output. Use circuit/diagram. (5)

SECTION - B

- Simplify the following Boolean function F together with the don't care conditions d in:
(i) Sum-of-products form and
(ii) Product-of-sums form:
 $F(w,x,y,z)=\Sigma((0,1,2,3,7,8,10)$
 $d(w,x,y,z)=\Sigma(5,6,11,15)$ (10)

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4. Discuss:

- (a) Classification of digital IC's. (5)
- (b) The important characteristics comparison of TTL, ECL and CMOS logic families. (5)

SECTION - C

- (a) From the truth table, realize the circuit of a Full Adder with the help of two half adders. (5)
- (b) With block diagrams, explain the functioning of MUX, DEMUX and Decoder. (5)
- (a) Draw the circuit of S-R flip flop using NAND or NOR gates and explain its truth table. Derive edge triggered J-K flip flop from S-R flip flop and explain it. (5)
- (b) Discuss race around condition in J-K flip flop and how it can be eliminated. (5)

SECTION - D

- Draw the circuits of:
(a) 4 bit shift register.
(b) 3 bit synchronous counter.
with J-K flip flops and explain their operations. (10)
- (a) Discuss the classification and important characteristics of semiconductor memories. (5)
- (b) Write a note on Programmable Logic Arrays (PLA's). (5)

[P.T.O.]

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[P.T.O.]

- (c) Define Absolute and Atmospheric pressure .
- (d) Define Convective and Local acceleration.
- (e) Differentiate between forced and free vortex flow.
- (f) Define Nappe and Crest.
- (g) What is an equivalent pipe?
- (h) What is meant by water hammer?
- (i) Define and state the significance of Mach's number.
- (j) What is an orifice? (10×2=20)