

Roll No. ....

Printed Pages : 2

**34005**

**BT-4 / M-18**

**DIGITAL ELECTRONICS**

**Paper-ECE-204E**

*Time allowed : 3 hours]*

*[Maximum marks : 100*

*Note :- Attempt any five questions.*

1. (a) Implement Boolean expression for E-OR gate using NAND gates. 10  
(b) What is Demorgans theorem? Solve using this theorem the following: 10  
$$(A + B) \cdot (C + D) = \overline{\overline{(A + B)}} + \overline{\overline{(C + D)}}$$
2. (a) Represent decimal numbers 27 in binary form using 6  
(i) BCD Code (ii) Excess-3 Code (iii) Gray Code  
(b) Find a minimal SOP representation for 14  
 $f(A, B, C, D, E) = \Sigma m(1, 4, 6, 10, 20, 22, 24, 26) + d(0, 11, 16, 27)$  using K-map method. Draw the circuit of the minimal expression using only NAND.
3. (a) Realize  $F(w, x, y, z) = \Sigma(1, 4, 6, 7, 8, 9, 10, 11, 15)$  using 8 to 1 Mux. 10  
(b) Design a BCD to Gray code converter. Uses don't care. 10
4. (a) Draw a 2-bit ripple counter and convert this into a 2-bit ring counter. 10  
(b) Convert T-Flip Flop into an SR- Flip Flop. Draw the circuit. 10
5. (a) Explain the working Master / Slave JK FF. 5

**34005**

[Turn over

( 2 )

- (b) Explain the operation of 3 input TTL NAND gate with required diagram and truth table. 10
- (c) Explain the terms: Fan-in, Fan-out, Tri-state gates, and Propagation delay. 5
6. (a) Explain the working of TTL logic family and also highlight the advantages of TTL family. 10
- (b) Explain the operation of CMOS Logic family. 10
7. (a) Explain in detail the functioning of A/D converter. 10
- (b) Design a combinational circuit using a ROM. The circuit accepts a three bit number and outputs a binary number equal to the square of the input number. 10
8. Explain the following in detail:-
- (i) R/2 R Ladder D / A Converter 10
- (ii) Dual Slope ADC 10



**34005**