26 May 08 S.E. (Elect.) III (Rev) Digital Electronics

Con. 2611-08.

(REVISED COURSE)

CO-9512

(3 Hours)

[Total Marks : 100]

N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.

1. (a) Explain Gray Code and give applications. 6
(b) Explain Error Correcting Codes. 6
(c) Convert from Hex to Binary $(0{\cdot}A25)_{16}$. 4
(d) Convert $(371)_8$ to equivalent hexadecimal form. 4

2. (a) Explain Alphanumeric Codes. 4
(b) Peform following conversions : 6
(i) $(919{\cdot}89)_{10}$ to binary
(ii) $(625{\cdot}625)_{10}$ to octal.
(c) Peform the following arithmatic : 10
(i) $(11001)_2 \times (110)_2$
(ii) 1101001 ÷ 101

3. (a) Simplify the following using Boolean theorems : 10
(i) $[(A + \bar{A}B)\ (A + \bar{A}\bar{B})]\ [(CD + \bar{C}\bar{D}) + (C \oplus D)]$.
(ii) $\bar{X}\bar{Y}\bar{Z} + \bar{X}Y\bar{Z} + X\bar{Y}\bar{Z} + XY\bar{Z}$.
(b) Implement the following using 2 input NOR gates : 10
(i) $Y = \bar{A}B + \bar{B}C$
(ii) $Z = A \oplus B$.

4. (a) Explain Ring Counter. 8
(b) Write short notes on :– 12
(i) Programmable logic array
(ii) Serial in Parallel out register.

5. (a) Write short notes on :– 10
(i) Fan out, Fan in
(ii) Propagation Delay.
(b) Explain interfacing of following logic families : 10
(i) TTL driving CMOS
(ii) CMOS driving TTL.

6. (a) Explain what is master slave flip–flop and give its applications. 10
(b) Give difference between synchronous counter and asynchronous counter. Give merits and demerits of these counters. 10

7. (a) Simplify this using K–map. 8
$F(A, B, C, D) = \Sigma m\ (1, 5, 6, 7, 11, 12, 13, 15)$.
(b) Minimise expression using Quine–McCluskey method. 12
$f(A, B, C, D) = \Sigma m\ (1, 3, 5, 10, 11, 12, 13, 14, 15)$.