



UF-6227

B. E. - II (Sem. - III) (IC) Examination
May\June - 2012
Digital Circuits

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दृशावेव निशानीवाणी विगतो उत्तरवाडी पर अवश्य लपवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. - II (Sem. - III) (IC)

Name of the Subject :
Digital Circuits

Subject Code No. : 6 2 2 7 Section No. (1, 2,.....): Nil

Seat No. :
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Student's Signature

- (2) Attempt all questions.
(3) Assume suitable data wherever required.
(4) Figure to the right indicate full marks.

- 1 (a) Answer the following questions. **10**
- (i) _____ is the gray code of 1110.
(ii) Implement $Y=(A+B)(C+D)E$ with the help of logic gates.
(iii) Simplification of $A+AB+ABC$ is _____.
(iv) Write D'Morgan theorem for three variables.
(v) Draw the symbol of 4 to 1 line multiplexer.
(vi) _____ is the binary equivalent of decimal number 101.
(vii) 2's complement of 10101010 is _____.
(viii) What is the full form of ASCII ?
(ix) Draw the symbol and truth table of ExOR gate.
(x) What is the dual of $A+1=1$?
- (b) Explain BCD adder with circuit diagram and truth table **10** in detail.
- 2 (a) Prove that NAND and NOR are Universal gates. **7**
(b) Implement following boolean function using 8:1 **7** multiplexer $F(A, B, C, D) = \sum m(2, 4, 5, 7, 10, 14)$.

OR

- 2 (a) Explain 3 to 8 line decoder with truth table and circuit diagram. 7
 (b) Implement full adder circuit with multiplexers. 7
- 3 Attempt any **two** : 16
 (i) Simplify the following Boolean function using tabulation method $F(A,B,C,D) = \sum m(0,1,3,7,8,9,11,15)$.
 (ii) Simplify following boolean functions using K-map
 (1) $F(a,b,c,d) = \sum m(1,5,7,9,11,13,15)$
 (2) $F(w,x,y,z) = \sum m(1,3,4,5,7,9,11,13,15)$.
 (iii) Design 3 bit odd parity generator and checker circuit.
- 4 (a) Attempt any **five** : 10
 (i) For J-K Flip-flop output is toggle when $J = \underline{\hspace{2cm}}$ $K = \underline{\hspace{2cm}}$.
 (ii) Time race condition can be solved by flip-flops.
 (iii) Write truth table and excitation table of the S-R flip-flop.
 (iv) Define 'Propagation Delay'.
 (v) Differentiate Synchronous and asynchronous circuits.
 (vi) List types of Shift Register.
 (vii) Write truth table and excitation table of the T- flip-flop.
 (b) Explain 4 bit Up/Down counter with necessary waveforms. 10
- 5 Attempt any **two** : 16
 (i) Explain Application of Flipflops in detail.
 (ii) Explain Universal Shift register in detail.
 (iii) Explain what is edge trigger flip-flop and its working.
- 6 Attempt any **two** : 14
 (i) Compare ROM and PLA in detail.
 (ii) Design BCD Counter with JK flip flop. Draw necessary waveform.
 (iii) Explain shift register with Parallel Load.