Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

B.Sc.(IT) (2013 & 2014) (Sem.–2)

DIGITAL ELECTRONICS FUNDAMENTALS

Subject Code : BS-102

Paper ID : [B0405]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and a student has to attempt any FOUR questions.**

SECTION-A

Q1. Answer briefly :

a) Convert the hexadecimal number $(ABH)_{16}$ to binary and decimal numbers.

b) Convert gray code 101011 into its binary equivalent.

c) Realize AND and OR gates using only NAND gates

d) Perform the binary subtraction :
110110-100010

e) Prove that $A + \overline{A}B = A + B$

f) Give the difference between SOP and POS forms.

g) What is programmable logic array? How it differs from ROM?

h) Give the comparison between synchronous & Asynchronous sequential circuits.

i) Draw the logic diagram for SR latch using two NOR gates.

j) What is universal shift register?

SECTION-B

Q2. a) Simplify the following logic expressions using Boolean algebra.
F=AB+A(B+C)+B(B+C)

b) Minimize the given Boolean function using K-map.
f(A,B,C,D)=∑m(0,1,7,8,13,15)+φ(2,6,10,11).

Q3. a) Explain step by step the design of full adder using two half-adder and one OR gate.

b) Design a BCD counter using J-K flip-flop.

Q4. Draw the circuit of a typical semiconductor ROM, using BJT and explain its working.

Q5. Convert a clocked D flip-flop to a clocked J-K flip-flop by adding external gates.

Q6. a) Design a excess-3-to-BCD code converter using minimum number of NAND gates.

b) Write the minimized expression using K-map of the following expression :
y=πM(l,2,4,7,8)
and realize the circuit using NAND gates.

Q7. Write short notes on **any two** :

a) BCD subtractor

b) CAM

c) Code converter