Bachelor of Science (B.Sc.I.T.) Semester—II (C.B.S.) Examination

FUNDAMENTALS OF DIGITAL ELECTRONICS

Paper—I

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) **All** questions are compulsory and carry equal marks.

(2) Draw neat diagrams wherever necessary.

EITHER

1. (A) Explain the method of converting decimal number into its binary equivalent. 5

(B) Obtain the following conversions :

(i) $(24)_{10} = (\quad\_\_\_\_\_)_{2}$

(ii) $(10110)_{2} = (\quad\_\_\_\_\_)_{10}$

(iii) $(101)_{10} = (\quad\_\_\_\_\_)_{2}$

(iv) $(FA0)_{16} = (\qquad\quad)_{8}$. 5

OR

(C) Explain XS-3 code. What are its uses ? 5

(D) How does other codes differ from XS-3 code ? Explain. 5

EITHER

2. (A) Explain EX-OR gate using basic gates. 5

(B) Design AND, OR, NOT and NOR gates only using NAND gates. 5

OR

(C) State and prove De Morgan’s theorem. 5

(D) What is the use of K-map ? Explain. 5

EITHER

3. (A) Draw half adder circuit and explain. 5

(B) What is a multiplexer ? Explain with an example. 5

OR

(C) Explain the construction of a 4-bit asynchronous counter with timing diagram. 5

(D) Draw RSFF using NOR gates and explain its working. 5

EITHER

4. (A) Explain volatile and non-volatile memory. 5

(B) Write a note on Cache Memory. 5

OR

(C) Explain the difference between Hard disk and Optical disk. 5

(D) Explain difference between semiconductor and magnetic memory. 5

5. (A) Explain the method of subtraction of two binary numbers using 2's complement method. 2½

(B) Construct X-OR gate using NOR gates. 2½

(C) What is race around condition ? How to avoid it ? Explain. 2½

(D) Draw a block diagram of computer and explain in brief. 2½