

B.Sc. (Part-I) Semester-II Examination
ELECTRONICS
(Digital Electronics)

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) All questions are compulsory.

(2) Draw neat sketches wherever necessary.

1. (A) Fill in the blanks :

- (i) According to Boolean Algebra $\overline{\overline{A}}$ _____. ½
 (ii) Base of Binary number system is _____. ½
 (iii) Multiplexer circuit has many inputs and _____ output. ½
 (iv) ROM stands for _____. ½

(B) Choose correct alternative and rewrite the sentence :

(1) The Boolean equation for NAND gate is :

- (a) $\overline{A+B}$ (b) $\overline{A.B}$
 (c) $\overline{A}+\overline{B}$ (d) $\overline{A.B}$ ½

(2) Bistable multivibrator has :

- (a) One stable state (b) Two stable states
 (c) Three stable states (d) None ½

(3) In JK flip flop when $C|K=1$, $J=1$ and $K=f$ then output is :

- (a) Set (b) Reset
 (c) Last state (d) Toggle ½

(4) A Shift Register is a :

- (a) Combinational circuit (b) Sequential circuit
 (c) Clock (d) None ½

(C) Answer in **one** sentence :

- (1) Define fan in. 1
 (2) What is Demultiplexer ? 1
 (3) What is Counter ? 1
 (4) Define radix of a number system. 1

EITHER

2. (A) Perform the following :

- (i) $1011 + 0100$
 (ii) 101×11
 (iii) $(1010)_2 = (x)_{10}$
 (iv) $1100 - 1000$ by 1's complement method. 1½×4=6

(B) Why NAND and NOR are called universal logic gates ? Explain in brief. 6

OR

- (P) Explain the working of Full Adder. 6
(Q) State different Boolean laws and explain. 6

EITHER

3. (A) Prove that $A(A+B) = A$ and $A+\bar{A}B = A+B$ by using Boolean laws. 6
(B) Explain with examples pairs, quads and octets in K-map. 6

OR

- (P) State and prove De Morgan's Theorems. 6
(Q) Give the classification of logic families. Explain two input DTL NAND gate. 6

EITHER

4. (A) Explain the working of RS Flip Flop using NOR gate. 6
(B) Explain in brief working of monostable multivibrator. 6

OR

- (P) Explain the working of D Flip Flop. 6
(Q) Explain working of JKMS Flip Flop. 6

EITHER

5. (A) Draw a circuit diagram of Ring counter and explain its working. 6
(B) Explain parallel in parallel out Shift Register. 6

OR

- (P) Differentiate between Synchronous and Asynchronous counter. Explain the working of mod.7 asynchronous counter. 6
(Q) Explain SISO shift register. 6

EITHER

6. (A) With suitable logic diagram, explain 2 to 4 Line Decoder and give its truth table. 6
(B) Differentiate between Multiplexer and Demultiplexer. Draw a neat circuit diagram of 4:1 multiplexer. 6

OR

- (P) Explain the working of 1:4 Demultiplexer. 6
(Q) Explain the working of BCD to decimal Decoder. 6

EITHER

7. (A) Explain how semiconductor memories are classified. What is difference between RAM, ROM and PROM ? 6
(B) Differentiate between Volatile memory and Non-volatile memory. 6

OR

- (P) What are Primary and Secondary memories ? Explain. 6
(Q) Explain the concept of Memory Hierarchy. What is Flash memory ? 6