

Bachelor of Science (B.Sc.) Semester—II Examination**ELECTRONICS (Advanced Digital Electronics)****Optional Paper—2**

Time : Three Hours]

[Maximum Marks : 50

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

(2) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (A) What is Tri-state logic ? Explain its working with truth table and logic symbol. Explain the construction and working of 2-input CMOS NAND-gate. 1+3+6=10

OR

(B) Explain in detail, the construction and working of :

(i) TTL 2-input NAND-gate

(ii) CMOS 2-input NOR-gate. 5+5=10

EITHER

2. (A) Draw the logic diagram of JKFF and explain its working. Discuss Race-Around-Condition in JKFF alongwith timing diagram. How to overcome it ? 5+3+2=10

OR

(B) Draw the logic diagram of clocked RS Flip-Flop and explain its working with the help of truth table. Explain the limitations of RSFF. 8+2=10

EITHER

3. (A) Determine the number of Flip-Flops required for the construction of :

(i) MOD-3 counter

(ii) MOD-6 counter

(iii) MOD-13 counter

(iv) MOD-24 counter

Draw the logic diagram of 4-bit Ring Counter and explain its working with truth table and timing diagrams. 4+6=10

OR

(B) What is Counter ? List different types of counters. Draw the logic diagram of 4-bit binary up counter and explain its working with truth table and timing diagrams. 1+1+8=10

EITHER

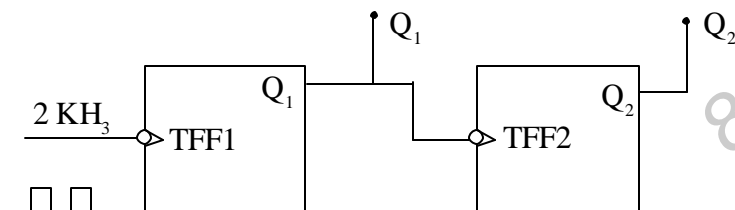
4. (A) What is memory ? Give the classification of memory on the basis of speed. Construct 32×4 size memory block using 16×4 memory modules. 1+4+5=10

OR

(B) What is shift register ? State different types of shift registers. Draw the block diagram of 4-bit SIPO shift register and explain its working with truth table and timing diagrams. 1+1+8=10

5. Solve any **TEN** :

- (i) What is totem pole output ?
- (ii) Define “fan-in”.
- (iii) Write any two advantages of CMOS.
- (iv) What is forbidden state in RSFF ?
- (v) What is positive edge triggered Flip-Flop ?
- (vi) Why are edge triggered Flip-Flops preferred in digital system ?
- (vii) What is modulus of a counter ?
- (viii) In figure shown, what will be the frequency at Q_2 output ?



- (ix) State the application of down counter.
- (x) Which property of Flip-Flops is used in the construction of shift register ?
- (xi) What is ROM ?
- (xii) What is volatile memory ?

10×1=10