2021

PHYSICS — GENERAL

Paper : DSE-B-1 (Practical)

(Digital Electronics)

Time: 1 Hr. **Full Marks: 30**

Answer ***any one*** of the following

1. (a) What is a logic gate? What do you mean by basic logic gates? Name the basic logic gates. What do you mean by universal logic gates? Name the universal logic gates.
   (b) Draw the pin diagram of a NAND Gate (IC 7400).
   (c) Write down the truth table of NAND gate.
   (d) Design AND, OR, NOT and XOR gates using NAND gates.
   (e) Write down the truth table of AND, OR, NOT and XOR gate.

   (2+2+1+2+1)+2+2+(3+3+2+3)+ (2+2+1+2)

2. (a) What is a half adder? Write down one of its usage.
   (b) What is a full adder? Write down one of its usage.
   (c) Compare the function of a full adder and a half adder.
   (d) Design a half adder and a full adder using NAND/NOR gate. Write down the truth table of each of them.

   (2+1)+(2+1)+4+(4+6+4+6)

3. (a) What is a flipflop? What is its function?
   (b) Design a SR flipflop circuit using NAND gates. Write down its truth table. What is the significance of S =0, R = 0 state? Why the condition S = 1, R = 1 is forbidden here? How this condition can be avoided?
   (c) Draw the circuit diagram of a clocked SR flipflop circuit using NAND gates.
   (d) Design a D flipflop circuit using NAND gates and write down its truth table.

   (2+2)+(3+3+2+2+2)+4+(6+4)