PG/IIS/ELC/203/23

M.Sc. 2nd Semester Examination, 2023

ELECTRONICS

PAPER – ELC-203

Full Marks : 50

Time : 2 hours

The figures in the right hand margin indicate marks

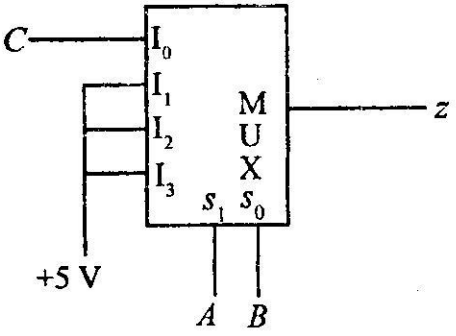
Candidates are required to give their answers in their own words as far as practicable

1. Answer any *four* questions : 2×4

   (*a*) Implement NAND gate using diode and transistor only.

   (*b*) Implement XOR gate using NOR only.

   (*c*) The MUX shown below is a 4 × 1 multiplexer. Find out the output of the following :



(*d*) Differentiate between synchronous and asynchronous counter.

(*e*) Prove that $A + BC = (A + B)(A + C)$.

(*f*) What is the advantage of ECL circuit ?

2. Answer any *four* questions : 4×4

(*a*) Simplify the Boolean expression using k-map.

$$F = \overline{A} + AB + AB\overline{D} + A\overline{B}\overline{D} + C$$ 4

(*b*) Implement full adder circuit using 4×1 MUX. 4

(*c*) Design 4-bit magnitude comparator circuit. 4

(*d*) Convert SR F/F to JK F/F. 4

(*e*) Design Ring counter and mention its different state. 2 + 2

(*f*) Write Totem-pole configuration of TTL NAND gate. 4

3. Answer any *two* questions : 8 × 2

(*a*) Design MOD-10 synchronous counter. 8

(*b*) Write short notes on SAR A/D converter circuit. 8

(*c*) Design a counter which counts (0, 2, 4, 5, 7, 8, 9 and 0). 8

(*d*) Write short notes on different types of shift registers. 8

[Internal Assessment — 10 Marks]
