*Candiates are required to give their answer in their own
words as far as practicable.*
The figures in the margin indicate full marks.

Group - A

THEORY (Marks : 40)

Answer any *two* from the following questions :   2×20

1. Answer any *five* questions from the following :   5×4

   (a) State Demorgan's theorem for Boolean algebra.

   (b) Write down the drawback of ICs.

   (c) Why NAND and NOR gates are called universal gates ?

(d) Give the idea of RAM and ROM.

(e) What is race around condition in J-K flip flop ?

(f) Convert $(257.5)_8$. into decimal equivalent.

2. (a) (i) Draw the pin diagram of IC-555.

     (ii) Add the two number using 2's complement method 0010000 and 11101000.   6

(b) Draw the circuit diagram of RS flip flop using NOR gate and give the truth table of RS flip flop.   6

(c) (i) Write down the definition of Register.

     (ii) Classify the register depending on form of entering and retrieving data in a register.   8

3. (a) Design a 4 : 1 multiplexer.   6

(b) What is counter ? Write down the difference between half adder and full adder. Write the full form of VLSI. What is encoder ?   8

(c) Draw a circuit diagram of 4 –bit shift register using D – flip flop and explain its operation assuming data word "1011".   6

4. (a) Implement the Boolean expression $f(A, B, C) = \sum m(0, 3, 4, 7)$ by Karnaugh map.   6

(b) Construct AND gate using transistor and explain its operationl.   6

(c) Write the difference between analog and digital circuit. Give the examples of linear and digital ICs. Give truth table of X-OR gate.   8

Group - B

PRACTICAL (Marks : 20)

Answer any *one* from the following questions :   1×20

1. (a) Veriry and design AND, OR and NOT gates using NAND gates..

    (b) Write down the related theory and truth table only related to these.

    (c) Draw the circuit diagram for this experiment.

2. (a) Design a switch (NOT gate) using a transistor.

    (b) Write down the working formula and truth table related to these.

    (c) Draw the circuit diagram for this experiment.

3. (a) Design an astable multivibrator using 555 timer.

    (b) Write down the working formula only related to these.

    (c) Draw the circuit diagram for this experiment.

_____