Total No. of printed pages = 5

DIGITAL ELECTRONICS

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks
for the questions.

PART – A

Marks – 25

1. State whether the following are true or false :

   $1 \times 10 = 10$

   (a) TTL is used in electronic calculator.

   (b) In signed numbers, MSB is the sign bit.

   (c) Gray code of 1011011 is 1110110.

   (d) NAND gate can work as inverter if both inputs
   are not connected together.

[Turn over

(e) In a sequential logic circuit the output depends on the present input only.

(f) A positive edge triggered flip-flop changes state on the high to low transition of the clock pulse.

(g) In synchronous counter, the clock inputs are connected separately.

(h) For M memory location we need P address line where $2^P = M$.

(i) Most commonly used D/A converter is the binary ladder network.

(j) K-map cannot be drawn when the number of variables is more than 4.

2. Fill in the blank : $1 \times 10 = 10$

(a) Serial loading means entering —— bit per clock pulse.

(b) The process of entering information into memory is called ——.

(c) In X-OR gate, the same input gives the —— output.

(d) EPROM can be erased by using —— light.

(e) In a multiplexer the particular input appearing at the output depends on the status of —— lines.

(f) A —— can be used as demultiplexer.

(g) Each term in POS form is called —— term.

(h) $1111.10_2 + 10.011_2 = $ ——.

(i) The —— family has good noise immunity.

(j) Decimal number 90 equals —— in 2's complement.

3. Write the full form of : $1 \times 5 = 5$

(i) EEPROM

(ii) EBCDIC

(iii) CMOS

(iv) ASCII

(v) ECL

PART – B

Marks – 45

1. Convert the following : $2 \times 2\frac{1}{2}=5$

   (a) $FA5_{16}$ into octal.

   (b) 7.2_{10} into excess-3 code.

2. Minimize logic function   5

   $F(A,B,C,D) = m(0,1,4,5,7,8) + d(10,11,14)$ using k-map.

3. What is race around condition ? Describe the logic circuit of a clocked J-K flip-flop with Preset/Clear input and truth table.   5

4. State De Morgan's theorems and explain with logic diagram.   5

5. Realize the logic equation : $2 \times 2\frac{1}{2}=5$

   (a) $Y = A\bar{B} + BC + \bar{C}\bar{A}$ by using NAND gate only

   (b) Convert $Y = ABC + A\bar{B}D + BC + AD$ into standard SOP form.

6. Explain the operation of a 5 bit serial out shift register.   5

7. Classify various types of semiconductor memory devices and the principles of operation of physical characteristics.   5

8. Explain difference between : $2 \times 2\frac{1}{2}=5$

   (a) TTL and CMOS circuit.

   (b) Synchronous and Asynchronous counter.

9. Write short notes on any *one* :   5

   (a) 8:1 Multiplexer

   (b) Ring counter

   (c) A//D converter.