Total No. of printed pages = 3

Et-403/DE/4th Sem/Etc/2017/M

DIGITAL ELECTRONICS

Full Marks –70

Pass Marks – 28

Time – Three hours

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

Answer question No.1 and any *four* from the rest.

1. (a) Convert $(326)_{10}$ to octal. 2×7=14

   (b) Convert $(26{\cdot}125)_{10}$ to binary.

   (c) Convert $(10110110)_2$ to Gray code.

   (d) Add $(1739)_{16}$ and $(D2A3)_{16}$

   (e) Subtract $(10011)_2$ from $(10110)_2$ by using 2's complement method.

   (f) Write the next two hexadecimal numbers : 2C, 2D, 2E, —— , —— .

   (g) Define Ex-3 code with example.

[Turn over

2. (a) What is K-map ? Using K-map minimize the following : 2+6=8

$f(A, B, C, D) = \sum m (0, 1, 2, 3, 7, 8, 9, 11, 12, 13)$.

(m stands for min terms).

(b) Define NOR and NAND gate with their symbol and truth table. Why they are called universal logic gate ? 4+2=6

3. (a) State and prove the De-Morgan's theorem. 6

(b) Using Boolean algebra, prove : 3

$(A + B)(A + C) = A + BC$

(c) Draw the logic circuit for the following : 5

(i) $y = A\bar{B} + BC + \bar{C}\bar{A}$

(ii) $y = \overline{(A+B)}\, C + C\,\bar{B}$

4. (a) Realize a R-S flip-flop using NAND gate only. 5

(b) Draw the logic circuit of a clocked J-K flip-flop and explain it with proper truth table. 5

(c) Give the difference between static and dynamic RAM. 4

5. (a) Explain a 4-bit shift register with neat diagram. Also define SIPO and PISO shift registers. 7

(b) What is modulus-3 counter ? Explain a 3-bit asynchronous counter with proper circuit diagram. 7

6. (a) Design a 8 : 1 multiplexer by using NAND gate only. 5

(b) Explain the working principle of a BCD to 7-segments decoder IC 7447. 5

(c) Give the difference between sequential logic and combinational logic circuit. 4

7. Write short notes on any *two* : 2×7=14

(a) 4-bit parallel binary adder

(b) D/A converter

(c) CMOS logic families

(d) ASCII code.