This question paper contains **3** printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **6887**

Unique Paper Code : **222461** **D**

Name of the Paper : **Digital Electronics (ELPT-404)**

Name of the Course : **B.Sc. Physical Sciences (Electronics)**

Semester : **IV**

Duration : **3 Hours** Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *Five* questions.

All questions carry equal marks.

1. (*a*) Subtract 01101 from 11011 using the 1's complement method. 5

(*b*) Convert the binary number 1100 to its Gray-Code equivalent. 5

(*c*) $(5AB.1C)_{16} = (?)_{10}$ 2.5

(*d*) $(19)_{10} = (?)_{8}$. 2.5

2. (*a*) Draw the circuit diagram of XNOR gate using NAND gates and give its truth table. 5

(*b*) Explain with suitable diagram, the working of TTL circuits. 5

(*c*) What is AND–OR network for, Y = A′B′C + ABC′ + AB′C + ABC after simplification ? 5

P.T.O.

3. (*a*) Develop the Product-Of-Sum expression for F_1, F_2 and F_3 given in the table : 7

A	B	C	F_1	F_2	F_3
0	0	0	0	0	1
0	0	1	0	1	1
0	1	0	1	1	1
0	1	1	1	1	0
1	0	0	1	0	0
1	0	1	0	1	0
1	1	0	1	1	1
1	1	1	1	0	1

(*b*) Simplify the following function and design a circuit diagram with NAND gate : 8

$$F(A, B, C, D) = \Sigma_m(0, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15).$$

4. (*a*) What is Demultiplexer ? Explain its operating principle. Discuss the 1-line-to-4-line Demultiplexer. 8

(*b*) What is Decoder ? Explain the Decoder for BCD to Decimal with circuit diagram. 7

5. (*a*) Draw the circuit diagram and truth table of Half Subtractor. 5

(*b*) Explain and draw the circuit diagram of Full Adder with truth table. 5

(*c*) Show that : 5

$$ABC + AB'C + ABC' = A(B + C).$$

6. (*a*) What is D-Flip Flop ? Draw its logic circuit and explain the operation. 8

(*b*) Draw and explain the logic circuit of the 4-bit Asynchronous Ripple Counter and design its waveform. 7

7. (*a*) Draw the waveform to shift the number 0100 into the Shift register, Serial In-Serial Out and explain its operation. 10

(*b*) For the 5-bits resistive divider, determine the following :

(*i*) The weight assigned to the LSB. 1

(*ii*) The weight assigned to second and third LSB. 1.5

(*iii*) The output voltage for a digital input of 1101. Assume 0 = 0 V and 1 = +10 V. 2.5

8. Write short notes on any *three* : 5+5+5

(*i*) RAM

(*ii*) PROM

(*iii*) CMOS

(*iv*) D/A converter.