

# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



U.G. DEGREE EXAMINATION – ALLIED OPTIONAL

THIRD SEMESTER – APRIL 2022

UPH 3405 – DIGITAL ELECTRONICS

Date: 21-06-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

## PART – A

Q. No Answer ALL Questions

(10 x 2 = 20 Marks)

- 1 Draw the logic symbol of T flip flop and give its truth table.
- 2 Find the complement of  $AD+BC$
- 3 Simplify using K-map =  $F(A, B, C) = \Sigma(0,2,4,6,7)$
- 4 Add 14 and 4 using binary addition.
- 5 Convert binary number  $(1101)_2$  to hexadecimal number.
- 6 Draw the circuit diagram of a three-bit ring counter.
- 7 What is meant by a shift register?
- 8 Differentiate between synchronous and asynchronous counters.
- 9 What is meant by product of sum method?
- 10 Draw the circuit of a RS flip flop and give its truth table.

## PART – B

Answer any FOUR Questions

(4 x 7.5 = 30 Marks)

- 11 Simply using K map  $Y = F(A, B, C, D) = \Sigma(0,2,3,4,6,8,9,11,13,14,16)$
- 12 a) Explain shift right shift register with a neat diagram. (5)  
b) Convert the following hexadecimal to decimal  $(D4)_H$  and  $(325)_H$  (2.5)
- 13 With a neat circuit, explain the working of a JK flip flop and give its truth table.
- 14 Discuss quads and octets in K map with an example each.
- 15 With a neat circuit, explain the working of a clocked RS flip flop and give its truth table.
- 16 Explain in detail the working of a synchronous up counter.

## PART – C

Answer any FOUR Questions

(4 x 12.5 = 50 Marks)

- 17 a) Differentiate between minterm and maxterm. (2.5)  
b) Explain in detail how NAND and NOR can be used as universal gates. (10)
- 18 Explain with a neat logic diagram the working of serial-in serial-out and serial-in parallel-out shift registers.
- 19 a) What are counters? Discuss the working of mod 4 and mod 8 counters. (10)  
b) What is meant by positive and negative logic? (2.5)
- 20 Discuss the operation of 3-bit ripple up counter.
- 21 a) Explain the working of a D-flip flop and T flip flop with its truth table. (9)  
b) Solve any three Boolean theorems. (3.5)
- 22 a) Solve the following 4 variable K map:  $F(PQRS) = \Sigma(0,2,5,7,9,10,12,14)$  (10)  
b) What is meant by NAND latch? (2.5)

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