LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2024**

UPH1MC02 – DIGITAL ELECTRONICS

Date: 13-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

		SECTION A - K1& K2 (CO1)
Q.No	Levels	**Answer ALL the Questions** **(10 x 2 = 20)**
1	K1	Find the decimal equivalent of binary numbers 100101 and 110110.
2		What is Hexadecimal Number system?
3		What is meant by logic gate?
4		What is Karnaugh map?
5		Find the 2's complement of binary number $(1011\ 1110)_2$
6	K2	Draw the circuit of Half Adder.
7		Give the use of flip flop. Which flip flop is mostly used?
8		What is D- flip flop?
9		Define Multiplexer.
10		What is meant by decoder?
		SECTION B– K3& K4 (CO2)
		Answer ALL the Questions **(4 x 10 = 40)**
11	K3	Convert the following numbers: a. $(19.625)_{10}$ to binary b. $(3FC.8)_H$ to decimal c. $(65,534)_{10}$ to hex equivalent d. $(41)_8$ to a binary e. $(105)_H$ to octal
		[OR]
12		Explain the laws of Boolean Algebra. Prove that $(A + C)(AD + A\overline{D})+AC + C = A+C$ and $A+CB = (A+B)(A+C)$
13		Discuss the function of Controlled inverter with suitable circuit.
		[OR]
14		Describe J-K Master slave flip flop. What are its advantages and disadvantages?
15	K4	Explain the action of decimal to BCD encoder.
		[OR]
16		Explain the following with reference to K-map: a) Pairs Quads and Octets

		b) Don't care conditions c) Simplify using K - map Y= F(A,B,C,D) = $\sum(1,3,7,11,15)+\sum d(0,2,5,8)$

17		Add the following binary numbers (a) $(1011)_2$ and $(1001)_2$ (b) $(1110)_2$ and $(1010)_2$ (c) $(1110110)_2$ and $(1100110)_2$ (d) $(101010)_2$ and $(011011)_2$
		[OR]
18		Explain the working of BCD to seven segment decoder.
		SECTION C – K5 & K6 (CO3)
	Answer ALL the Questions	**(2 x 20 = 40)**
19	K5	Explain basic logic gates with suitable diagram and truth table. Show that NAND and NOR are Universal logic gates
		[OR]
20		a) State the rules for binary subtraction. Discuss 1'complement and 2' complement method with examples. b) Describe the function of a Full Adder and obtain expressions for SUM and CARRY outputs
21	K6	With a neat circuit diagram explain the working of a RS flip-flop. State the difference between RS flip-flop and D flip-flop.
		[OR]
22		Explain the working of 1 to 4 demultiplexer. What are the differences between multiplexer and demultiplexer.

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