LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIFTH SEMESTER – **NOVEMBER 2024**

UPH 5601 – ELECTRONICS - II

Date: 21-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

	SECTION A - K1 (CO1)	
	Answer ALL the Questions -	**(10 x 1 = 10)**
1.	**MCQ**	
a)	Which part of the microprocessor performs arithmetic and logic operations? a) Control Unit b) Register c) Arithmetic Logic Unit (ALU) d) Cache	
b)	What is the size of the address bus in the 8085 microprocessor? a) 8 bits b) 12 bits c) 16 bits d) 32 bits	
c)	How many addressing modes are there in the 8085 microprocessor? a) 3 b) 4 c) 5 d) 6	
d)	In a second-order high-pass filter using operational amplifiers, which condition must be satisfied for resonance? a) The gain must be unity. b) The input frequency must be equal to the natural frequency of the system. c) The feedback resistor must be larger than the input resistor. d) The capacitor must be larger than the inductor.	
e)	In an R-2R ladder digital-to-analog converter, what is the significance of the '2R' resistor network? a) It helps in improving the accuracy of the conversion. b) It acts as a constant voltage reference. c) It provides a highly linear voltage output. d) It ensures equal current distribution.	
2.	**True or False**	
a)	The control unit of a microprocessor is responsible for performing arithmetic operations.	
b)	Flash memory is a type of volatile memory used to store firmware in microprocessors.	
c)	Pipelining allows a microprocessor to execute multiple instructions simultaneously.	
d)	A Phase Locked Loop (PLL) uses a voltage-controlled oscillator and feedback loop to align the phase and frequency of its output with a reference signal.	
e)	An inverting operational amplifier always produce negative output.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**Fill in the blanks**	
a)	The first commercially available microprocessor was the _____, released by Intel in 1971.	

b)	_____ mode in a microprocessor restricts the execution of certain instructions from malicious software.
c)	The 8085 microprocessor uses the _____ signal to indicate that it can receive data.
d)	The ability of an operational amplifier to reject common-mode signals is quantified by the _____.
e)	The _____ is a timing interval that can be programmed in a 555 timer.
4.	**Answer the following**
a)	Write the formula for an operational amplifier based non-inverting amplifier.
b)	Write an assembly language program to move 05H to the register C.
c)	Explain the virtual ground of an operational amplifier.
d)	What do you understand by a peripheral device?
e)	Give two examples for analog signals.
	SECTION B - K3 (CO2)
Answer any TWO of the following	**(2 x 10 = 20)**
5.	Explain the arithmetic instructions in the 8085 microprocessor.
6.	Discuss the format and classification of instructions based on the size of the instruction in an 8085 microprocessor.
7.	Form a weighted resistor digital to analog converter using an operational amplifier and explain its working.
8.	Using a neat diagram, explain the function of the flag register in the 8085 microprocessor, as well as the significance of each flag.
	SECTION C – K4 (CO3)
Answer any TWO of the following	**(2 x 10 = 20)**
9.	Describe the addressing modes used by the 8085 microprocessor.
10.	Write an assembly language program in 8085 to add two 8-bit numbers, and the result to be stored as 16 bits.
11.	With a neat sketch, explain the integrator and differentiator using an operational amplifier. (5 + 5)
12.	Draw and explain the functional diagram of the 555 timer.
	SECTION D – K5 (CO4)
Answer any ONE of the following	**(1 x 20 = 20)**
13.	Explain the 8085 microprocessor's architecture with a relevant diagram.
14.	Realize the 555 timer as (a) monostable and (b) astable multivibrators. (10 + 10)
	SECTION E – K6 (CO5)
Answer any ONE of the following	**(1 x 20 = 20)**
15.	Describe in detail the Programmable Peripheral Interface (PPI) Intel 8255 A with a suitable schematic diagram.

16.	Solve the quadratic equation $\frac{d^2v}{dt^2}+B\frac{dv}{dt}+Cv-v_1(t)=0$ using operational amplifiers.

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