

# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – PHYSICS

FIRST SEMESTER – NOVEMBER 2018

16/17/18PPH1MC03/PH 1819 – ELECTRONICS AND PROGRAMMING

Date: 30-10-2018

Dept. No.

Max. : 100 Marks

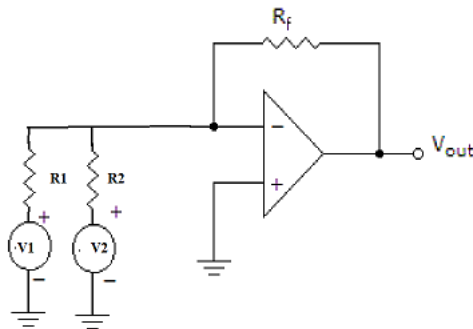
Time: 01:00-04:00

## Part A

Answer all the questions

(10 x 2 = 20 marks)

1. Find  $V_0$  in the circuit if  $R_f = 10 \text{ k}\Omega$ ,  $R_1 = 2 \text{ k}\Omega$  and  $R_2 = 5 \text{ k}\Omega$ .



2. What is CMRR? Give its ideal value.
3. Given that  $(BX) = 637D$ ,  $(SI) = 2A9B$ , Displacement = C237 determine the EA for register relative mode of addressing and based indexed mode of addressing.
4. Develop an ASM program to convert a two digit unpacked number in BX to packed BCD number in AL.
5. Write an ASM program sequence to copy an array of 5 numbers from one memory location to another, using string primitives.
6. Explain in detail stack memory location.
7. What is programmed I/O?
8. Give the significance of NMI and INTR in microprocessor 8086.
9. Write a short note on unary operators in C++.
10. Write a program in C++ to find the number of vowels in a character string.

## Part B

Answer Any FOUR questions

(7.5 x 4 = 30 marks)

11. With neat diagrams explain the working of OP AMP based integrator and differentiator.
12. What are addressing modes? Explain the different data addressing modes in microprocessor 8086 with an example.
13. Write a program sequence to move a block of data between two overlapping memory locations in microprocessor 8086.
14. Explain with a block diagram the sequence of events that occur when a maskable interrupt is initiated.
15. Write a program in C++ to perform multiplication of two 3x3 matrices.
16. Develop assembly language programs in microprocessor 8086 to convert a) PBCD to UPBCD b) Hexadecimal to PBCD (3+4.5).

**Part C**

**Answer Any FOUR questions**

**(12.5 x 4 = 50 marks)**

17. Solve the given simultaneous equations using Operational amplifiers

$$3x+y=11$$

$$x-y=1$$

18. Write a program sequence to solve  $y = a^2 + b^2 - c^2$  by defining a subroutine for square. Use register relative mode of addressing.

19. Write a program to sort a given set of 10 numbers in ascending or descending order depending on the choice of the user. Use register indirect mode of addressing.

20. Interface a seven segment display to a microprocessor 8086 and construct a program to display numbers from 0 to 9.

21. Develop programs in C++ to solve  $\int_0^1 \sqrt{(2x + 1)} dx$  by a) Trapezoidal rule b) Simpson's 1/3 rule (6+6.5)

22. With a neat diagram, explain the architecture of microprocessor 8086.

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