LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION - **PHYSICS**

FIRST SEMESTER – **NOVEMBER 2013**

PH 1819 - ELECTRONICS AND PROGRAMMING

Date : 11/11/2013 Dept. No. Max. : 100 Marks
Time : 1:00 - 4:00

Part – A

Answer **ALL** Questions. (10x2=20)

1. Design an OP-AMP based inverting amplifier circuit with a gain of 2.5.
2. What is CMRR?
3. Write a brief note on the Address and Data busses of µP8086.
4. Develop a program segment for µP8086 to store 00h to FFh in a byte array ARY.
5. Develop a program for µP8086 to reverse a two digit unpacked BCD number in AX.
6. If AH contains 55h and CL contains ABh, what will be the status of the conditional flags after (i) ADD AH,CL and (ii) XOR AH,CL.
7. Write a brief note on the $MIN/\overline{MAX}$ signal of µP8086.
8. Write a brief note on the XLAT *instruction* of µP8086.
9. What do you mean by identifiers and keywords in C++?
10. Write a program in C++ to solve the expression, $\sqrt{x+2y}$.

Part – B

Answer any **FOUR** Questions. (4x7.5=30)

11. a) Explain with a neat diagram the function of an OP-AMP as a summing amplifier (5)

    b) What will be the output voltage of a summing amplifier if $R_f=R_1=R_2=R_3=$ 10 kΩ and V_1=1V, V_2=0.8V and V_3=1.1V? (2.5)
12. Illustrate with two sample instructions for each, the various addressing modes of data in µP8086.
13. Develop an ASM program for µP8086 to check if the word variable N represents a leap year. If true, BL must be set to 1 else to 0. (Hint: A leap year is divisible by 4 and not by 64h).
14. Write a note on the interrupt controller 8259A.
15. Write a program in C++ to find the sum of 1+3+5 …………+99.

Part – C

Answer any **FOUR** Questions. (4x12.5=50)

16. a) What is a D/A converter? Explain the working of an R-2R ladder D/A converter (7.5)

    b) For a 5 bit R-2R ladder D/A converter, determine the full scale voltage and the output voltage when the MSB is set. Given 0 state = 0V and 1 state = 5V and R_f=R=10 kΩ. (5)
17. DPX and DPY are two 32 bit unsigned numbers. Develop an ASM program for µP8086 to find the product and store the result at DPZ. DPX, DPY and DPZ are word variables.
18. Develop an ASM program for µP8086 to copy an array to an overlapping area.
19. With a block diagram, discuss bus buffering and latching in maximum mode of µP8086.

Write a program in C++ to solve $\int_0^{10} \frac{dx}{1+x^2}$ using a) Trapezoidal rule and b) Simpson $^1/_3$ rule.