LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **PHYSICS**

FIRST SEMESTER – **APRIL 2016**

PH 1819 - ELECTRONICS AND PROGRAMMING

Date: 03-05-2016   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

Part – A

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

1. Design an OP-AMP based non inverting amplifier circuit with a gain of 2.5.

2. What is meant by input offset voltage and output offset voltage?

3. Explain the role of the mod field in an operational code of µP8086.

4. Develop a program for µP8086 to unpack a two digit packed BCD number in AL.

5. Develop a program for µP8086 to exchange the contents of two memory locations in the extra segment.

6. Develop a program for µP8086 to find the factorial of a number using the LOOP instruction.

7. Explain the role of $\overline{RQ}/\overline{GT0}$ signal of µp 8086 operated in maximum mode.

8. Write a note on the $XLAT$ instruction of µp8086.

9. With an example for each, explain any four data types in C++?

10. Write a program in C++ to accept from the keyboard the radius of a circle and display the area.

Part – B

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

11. Solve using Op-amps the simultaneous equations, 2X + 3Y = 5 and X + Y = 2.

12. Explain the various shift and rotate instructions available 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. With a block diagram explain how DMA transfers a datum by Bus Cycle Stealing.

15. Write a program in C++ to accept an integer from the keyboard, find the factorial and display the same.

Part – C

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

16. (a) Integrators are preferred to differentiators in analog computer applications-Justify.

(b) Solve using Op-amps, $\dfrac{d^2v}{dt^2} + b\dfrac{dv}{dt} + cv - v_1(t) = 0$ (2.5+10)

17. DPX and DPY are 32 bit and 16 bit unsigned numbers respectively. 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 sort a byte array in memory.

19. With a block diagram discuss bus buffering and latching in µP8086 operated in minimum mode.

20. Write a program in C++ to accept two 3x3 integer matrices and to display the product matrix in proper format.

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