LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – NOVEMBER 2017

17/16PPH1MC03/PH1819 - ELECTRONICS AND PROGRAMMING

Date: 08-11-2017 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

Part – A

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

1. Obtain an expression for the output of an Op-amp based differentiator.
2. Explain the significance of the offset null adjustment in Op-amps.
3. State the role of the 'DF' of μP8086.
4. Develop a program for μP8086 to convert a two digit packed BCD number in AL to unpacked BCD format in AX.
5. Write a program for μP8086 to divide two single digit unpacked BCD numbers available in memory.
6. Explain with an example how the 20-bit physical address is computed in μP8086.
7. Explain how an EQU statement is different from a DB statement of ASM86.
8. Write a note on the SEG prefix of μP8086.
9. With an example for each, explain any two relational operators in C++?
10. Write a program in C++ to accept from the keyboard an integer and display its factorial.

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. With an example for each, explain the shift and rotate instructions available in μP 8086.
13. Develop a program for μP8086 to find the number of times 'a' occurs in a byte array.
14. Explain the conditional branch instructions in μP8086.
15. Write a detailed note on the features of the interrupt controller 8259A.
16. Write a program in C++ to accept an integer from the keyboard and display whether it is a prime number or not.

Part – C

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

17. Solve using Op-amps, $\frac{d^2v}{dt^2} + B\frac{dv}{dt} + cv - v_1(t) = 0$
18. Develop an ASM program for 8086 to solve, $a = b^3 - c^3 + d^3$. Use register relative mode of addressing for data.
19. Develop an ASM program for μP8086 to capitalize a byte array.
20. With a block diagram discuss bus buffering and latching in μP8086 operated in minimum mode.
21. Write a note on DMA controller. With a neat diagram explain the sequence of events which take place during DMA transfer using BUS stealing. (3+9.5)
22. Write a program in C++ to accept two 3x3 integer matrices and display the product matrix.

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