LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2019**

PPH 1503 – ELECTRONICS AND PROGRAMMING

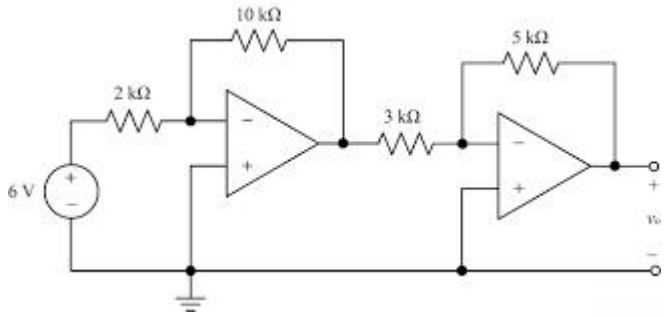
Date: 05-11-2019 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

PART - A

Answer ALL questions **(10x2 = 20)**

1. Give any four characteristics of an ideal OPAMP.
2. What is the output for the following circuit?



3. Write a short note on the RECORD directive in microprocessor 8086.
4. Write a program sequence to evaluate $Z \leftarrow W + Z/X$ using indirect mode of addressing in microprocessor 8086.
5. Give the significance of CLC and CMC instructions in microprocessor 8086.
6. Write a MACRO to find the square root of a given 8 bit number in microprocessor 8086.
7. What is the operation of HOLD and HLDA pins in microprocessor 8086?
8. State the difference between RET and IRET instructions in microprocessor 8086.
9. Write a short note on assignment operators in C++.
10. Develop a program in C++ to determine whether the given number is prime number or not.

PART - B

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

11. Solve the given simultaneous equations using operational amplifiers
    3x-y=12; 2x+y=13
12. Write a short note on internal interrupts in microprocessor 8086.
13. Develop an ASM program to find the largest of ten numbers stored in consecutive memory locations in microprocessor 8086.
14. Write a detailed note on the features of the interrupt controller 8259A.
15. Explain the conditional branching instructions in microprocessor 8086.
16. Develop a program in C++ to find the product of two 3x3 matrices.

PART - C

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

17. a) With a neat diagram discuss the working of an OPAMP based R-2R ladder D/A converter.

    b) Given R_f=10 kΩ, R=22kΩ for a R-2R ladder D/A converter, determine the output voltage for 10101, 11100 and 11001. 0 = 0V and 1 = 5V.

18. Write a program to calculate nCr using a procedure for factorial where the procedure and main program exist in different segments.

19. Develop an ASM program to perform addition of two 32 bit numbers stored in memory and save the 33 bit result.

20. With a neat diagram explain the events which take place during DMA transfer using BUS stealing.

21. Develop a program sequence to execute the following sequence by interfacing two switches and eight LEDs to microprocessor 8086

S1	S0	Pattern
0	0	Flashing
0	1	Rolling left to right
1	0	Converging
1	1	Alternate flashing

22. Write a program in C++ to solve $\int_0^2 \frac{dx}{2x+y}$ using a) Trapezoidal rule b) Simpson's 1/3 rule.

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