LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

THIRD SEMESTER – **NOVEMBER 2013**

PH 3504/PH 3502/PH 5501 – ELECTRONICS - I

Date : 06/11/2013   Dept. No.   Max. : 100 Marks

Time : 9:00 - 12:00

PART-A

Answer All Questions   **(10x2=20 Marks)**

1. What are the differences between a constant voltage source and a constant current source?
2. Briefly write about the h parameters of a transistor?
3. Write short notes on voltage divider biasing method of transistor?
4. Distinguish between the three types of multivibrators.
5. Write any four characteristics of an ideal OP-AMP.
6. State any two differences between FET and a transistor.
7. Write briefly about Karnaugh Map?
8. What is a multiplexer? Draw its block diagram.
9. What is a ripple counter?
10. What are the methods involved in shifting the data into a register?

PART-B

Answer ANY FOUR Questions   **(4X7.5=30 Marks)**

11. Derive the condition for transfer of maximum power from a source to a load. Discuss

    its applications.

12. Explain the operation of phase shift oscillator with a neat diagram. Discuss its advantages.

13. Explain the function of OP-AMP as summing and difference amplifier.

14. Explain the function of 7 segment decoder- driver with a neat diagram.

15. Explain the working of three bit binary ripple counter using JK flip flops.
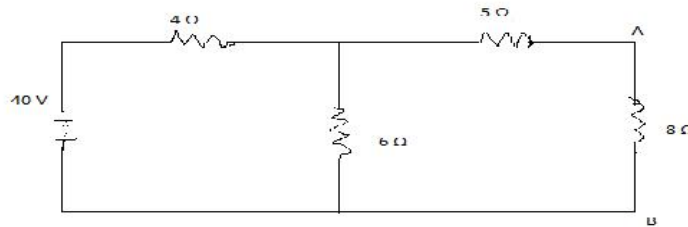
PART–C

Answer ANY FOUR Questions :   **(4x12.5 = 50 Marks)**

16. i) State and prove Norton's theorem .   (4 Marks)

   ii) Using Norton's theorem, find the current in the 8Ω Resistor of the network shown
       below.   (8.5 Marks)

17.   Explain the operation of RC coupled transistor amplifier and its frequency
       response with a neat diagram. Discuss its advantages, disadvantages and
       applications.

18 i) Explain the operation of an SCR as a half wave rectifier and discuss its mathematical
       treatment.   (8 Marks)

   ii) A half wave rectifier circuit employing an SCR is adjusted to have a gate current
       of 1 mA. The forward breakdown voltage of SCR is 100 V for I_g =1mA. If a
       sinusoidal voltage of 200 V peak is applied, find i) firing angle ii) conduction angle
       iii) average voltage iv) average current.   (4.5 Marks)

19.   With the help of logic diagram and truth table explain the working of

          i) JK flip flop   (5 Marks)

          ii) JK Master slave flip flop   (7.5 Marks)

20.   Explain the working of a MOD-5 counter. How can it be modified to function as a
       decade counter.   (6 + 6.5 marks)

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