LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD&FIFTH SEMESTER – APRIL 2017

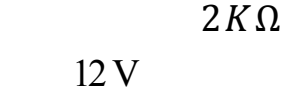
PH 3504 / PH 3502 / PH 5501 - ELECTRONICS - I

Date: 02-05-2017 Dept. No. Max. : 100 Marks
09:00-12:00

PART – A

Answer ALL questions: **(10 x 2 = 20 Marks)**

1. Convert the given constant voltage source into equivalent current source.

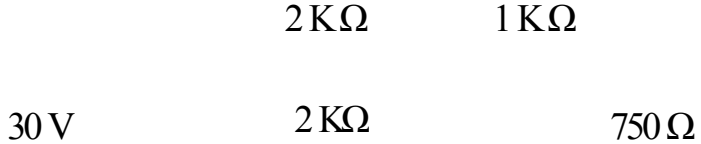


2. State maximum power transfer theorem.
3. Mention the different methods of biasing a transistor.
4. What is an astablemultivibrator?
5. State the characteristics of an ideal Operational amplifier.
6. What is an SCR? Draw its equivalent circuit.
7. What is andemultiplexer?
8. Draw the logic diagram and truth table of T flip flop.
9. What is a shift register?
10. Write any two differences between ROM and RAM.

PART – B

Answer any FOUR questions: **(4 x 7.5 =30 Marks)**

11. State Thevenin's theorem. Using it, find the current through 750 Ω resistance in the given circuit.



12. Describe the operation of single stage transistor amplifier with a circuit diagram.
13. What is a UJT? Sketch and explain its V-I characteristics.
14. Simplify using K-map, $Y = F(A,B,C,D) = \Sigma(0,2,5,7,8,10,13,15)$ and draw the logic circuit for the simplified expression.
15. Explain the function of 4 bit ring counter with its logic diagram and function table.

PART – C

Answer any FOUR questions: **(4 x 12.5 =50 Marks)**

16. What are hybrid parameters? Deduce the expressions for current gain, voltage gain and output impedance in terms of hybrid parameters for a transistor in CE mode.
17. (a) Explain the working of Wien-bridge oscillator with a circuit diagram. Mention its advantages and disadvantages. **(7.5 + 3.0)**

    (b) A Wien-bridge oscillator circuit is operated at 5 kHz. If the value of $R = 100\ k\Omega$, find the value of the capacitor C. **(2.0)**
18. (a) Derive the expression for voltage gain of an Op-Amp non-inverting amplifier**.** **(7.5)**

    (b) Explain the transfer characteristics of D-MOSFET. **(5.0)**
19. Discuss the working of (a) JK flip flop and (b) JK Master Slave flip flop with their logic diagrams and truth tables. **(6.0 + 6.5)**
20. With logic diagram, explain the working of MOD – 16 counter. How can it be modified to function as a decade counter? **(6.0 + 6.5)**

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