RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE, RAHARA
KOLKATA
END SEM EXAMINATION 2021-22
B.Sc. 1ST SEM ELECTRONICS (GENERAL)
GE-1

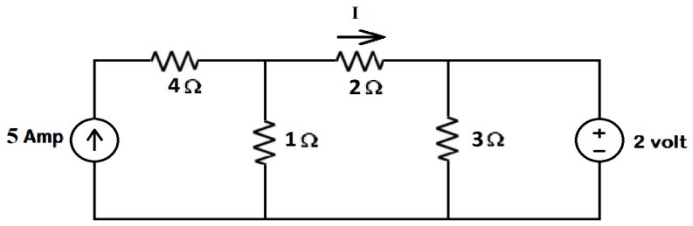
Time: 2 Hours **Full marks- 50**

Group-A

Answer any five (5) questions

1. State and explain Superposition Theorem. (5)

2. Find out Current I flowing through 2Ω resistor for the following circuit diagram using Superposition Theorem. (5)



3. (a) What is Thermal run away?
   (b) Draw the Output Characteristic curve of a Transistor in CE mode. (2+3)

4. Define α and β. Find out relation between α and β. (2+3)

5. Comment on Stability Factors of transistor. (5)

6. Discuss transistor as a two port device and define h-parameters. (5)

7. Mention major properties of Laminates. (5)

8. (a) What types of soldering materials are used in PCB board designing?

   (b) What are the different categories of Laminates available? (2+3)

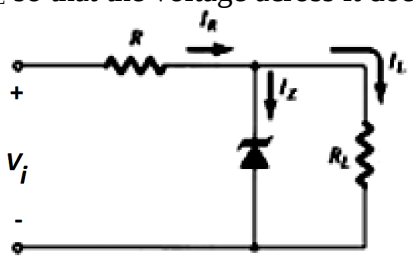
Group-B

Answer any five (5) questions

9. (a) 'At 0k intrinsic semiconductor behaves like an insulator'- explain.
   (b) The conductivity of a semiconductor lies in the range of _____ S/m.
   (c) Define *mass action law*. (2+1+2)

10. (a) Draw the energy band diagram and the FD distribution unction f(E) for and intrinsic semiconductor.
    (b) A silicon sample is doped with 10^{17} Arsenic atoms/CC. Find the equilibrium hole concentrations at 300K for the same. (3+2)

11. (a) Differentiate in between Ideal, simplified and piecewise linear equivalent circuits model of a PN diode.
(b) The 6v zener shown below has a zero zener resistance and knee current of 5mA. Find the minimum value of R_L so that the voltage across it doesn't fall below 6V. (3+2)



12. (a) State the differences in between a HWR & a FWR.
(b) State one advantage and one disadvantage of a Bridge rectifier. (3+2)

13. (a) Draw a neat output voltage waveform of a FWR in the presence and absence of a shunt capacitor in parallel to the load when an input ac is applied.
(b) Which one among these is preferred when a large load current flows, a capacitor filter or an inductor filter and why? (3+2)

14. (a) What are the essential components of a PCB?
(b) State two advantages and disadvantages of surface mount technology.
(c) How could we prevent the PCB board from contaminants? (2+2+1)

15. (a) Differentiate in between DSB PTH & DSB non PTH with suitable diagram.
(b) Draw a neat flowchart of major steps involved in the fabrication of double-sided through-hole board. (2+3)

16. (a) Determine the resistance of 1mm conductor of 1 cm length for standard copper foil of 35 μm thickness ($\rho = 1.724 \times 10^{-6} \Omega$ at 20°C).
(b) Write down precautions to reduce the coupling by a factor of 3 to 10.
(c) State two thermal considerations to ensure proper cooling of the electronic packages. (2+2+1)