[This question paper contains 2 printed pages.]

**Sr. No. of Question Paper : 1872** **GC-3** **Your Roll No.....**

Unique Paper Code : 42511101

Name of the Paper : Network Analysis and Analog Electronics

Name of the Course : **B.Sc. (Programme) Choice Based Credit System Exam.**

Semester : I

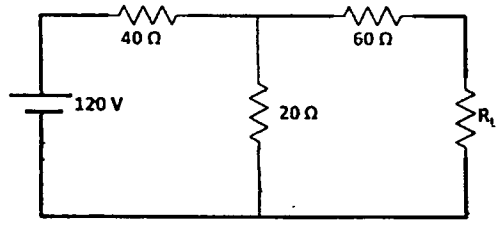
Duration : 3 Hours Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. **All** questions carry equal marks.

1. (a) State and prove Superposition theorem. (10)

   (b) Using maximum power theorem, find the value of $R_L$ and how much maximum power is transferred.




(5)

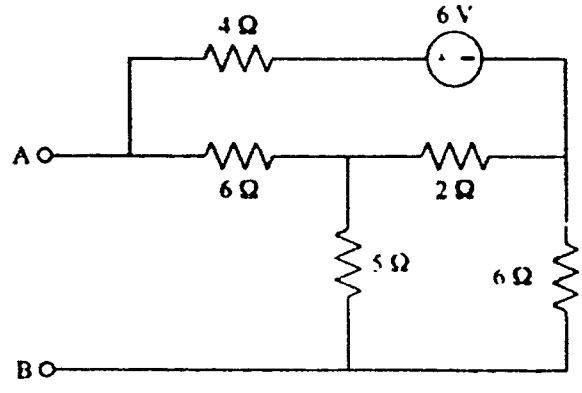
2. (a) Define Kirchhoff's laws for both current and voltage. (3)

   (b) Define Thevenin's theorem for any electrical circuit ? (2)

   (c) Simplify the following circuit into Thevenin as well as Norton equivalent circuits across port AB. Also verify that

$$I_N = \frac{V_{th}}{R_{th}} \ \& \ R_N = R_{th}$$

*P.T.O.*




(10)

3. Explain the working of a centre-tapped full wave rectifier. Find the expression for ripple factor and power conversion efficiency of the rectifier. (5,5,5)

4. (a) Explain the concept of thermal runaway. (3)

   (b) Define stability factor. Describe the voltage divider circuit for a CE Amplifier in detail and derive the expression for the stability factor in this case. (2,10)

5. Explain the working of an RC coupled amplifier and give its frequency response. How does the gain change at low, mid and high frequencies ? Derive the expressions for the gain in the three frequency regions. (15)

6. (a) What is feedback principle and explain Barkhausen criterion. (5)

   (b) Explain with a neat diagram the working of a phase shift Oscillator. Obtain expressions for the frequency of Oscillation and the condition for sustained oscillations. (10)

7. (a) With a neat diagram describe the working of a JFET. Give the output and the transfer Characteristics of the device. Discuss active, break-down and pinch off regions for the JFET ? (10)

   (b) How is a JFET different from a UJT ? (5)

8. Write short notes on any **two** of the following :

   (a) Zener diode

   (b) Hybrid parameters

   (c) The advantages of negative feedback (7½,7½)

(500)