Con. 7848-13. **GX-12031**

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **three** from remaining **five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume the **data** if it is **necessary**.

Q.1 Answer any four from the following [20]

a) Explain thermal runway and stabilization

b) Barkhausen criterion for sustained oscillation

c) Zener diode as a voltage regulator

d) Explain criterion for the selection of emitter by pass capacitor in an CE amplifier.

e) FET as differential amplifier

Q.2 a) Explain how the amplification factor, input impedance, output impedance and bandwidth are modified with negative feedback [10]

b) Explain the operation of C type filter in full wave rectifier with all necessary diagrams and waveforms. [10]

Q.3 a) Explain UJT as a relaxation oscillator in detail. Find frequency of oscillator [10]

b) What is MOSFET? Explain the construction and characteristics of N – channel MOSFET with the help of suitable diagram. [10]

Q.4 a) Derive the expression for voltage gain, current gain, input impedance and output impedance of CB amplifier. [10]

b) Explain the AC Analysis of Dual Input Unbalance Output Differential Amplifier. [10]

Q.5 a) Explain the working of CS FET amplifier. [10]

b) Derive the equation for frequency of oscillation of Colpitts oscillator. Also derive the condition for sustained oscillation. [10]

Q.6 a) What .is Darlington pair? What are its features? How to bias the pair? Derive expression for its ac parameters. [10]

b) Explain the differences between LC and RC oscillators. Give examples of each of oscillators with frequencies. [10]