Con. 6406-13. **GS-6180**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** from the **rest**.
(3) Make **suitable** assumptions.
(4) **Figures** to the **right** indicates **full** marks.

1. (a) Explain the construction and working of Schottkey diode. **5**
   (b) Explain why thermal stabilization is not necessary in JFET amplifiers. **5**
   (c) Explain why JFET is a voltage controller device. **5**
   (d) Explain the prnciple of operation of solar cell. **5**

2. (a) With the help of circuit diagram and the related wave form explain the full wave rectifier circuit. Derive the expressions for ac and dc output voltage. **10**
   (b) With the help of hybrid Pi model of common emitter amplifier derive the expressions for voltage gain and input impedance of BJT CE amplifier. **10**

3. (a) What are α, β, y in case of BJT ? What is the importance of these parameters ? **5**
   (b) Eplain the working principle of JFET with the help of input and output and transfer characteristics. **10**
   (c) Explain common drain field effect transistor. **5**

4. (a) What is current feedback and voltage feedback amplifier ? Explain it with the help of circuit diagram of BJT amplifier. **10**
   (b) Explain the constructin and working of Depletion MOSFET. How a MOSFET is different from JFET ? **10**

5. (a) Draw the circuit diagram dual input balanced output differential amplifier and obtain voltage gain with the help of its AC equivalent circuit. **10**
   (b) What is CMRR in case of differential amplier ? **5**
   (c) Explain what is thermal runaway. **5**

6. (a) Compare common emitter, common base and common collector BJT amplifier. **10**
   (b) Draw the hybrid Z model of common source field effect transistor and find the expressions for voltage gain input impedance and outpput impedance. **10**

7. Write short notes on any **three** :— **20**
   (a) Photoemissive device.
   (b) Optoisocator.
   (c) LED
   (d) Photo transistor.
   (e) Photodiode.