4TH SEM. /EE/EEE/EE(I & C)/ 2023(S)

TH-2   Analog Electronics and Op-Amp

Full Marks: 80   Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1.   Answer **All** questions   2 x 10
   a.   List any four applications of pn junction diode.
   b.   Draw the symbols of Tunnel diode, PIN diode, Zener Diode and pn-junction diode.
   c.   Define Peak Inverse Voltage and mention the value of PIV of half wave rectifier and full wave rectifier.
   d.   List different modes of operation of a transistor. In which mode, it can work as an amplifier?
   e.   Mention different types of MOSFET.
   f.   Name any two types of (a) oscillators (b) power amplifiers
   g.   Write any two advantages of FET over BJT.
   h.   Draw the DC load line of base resistor biased transistor.
   i.   Find the gain of an inverting op-amp having input resistance R_{in}=100Ω and feedback resistor R_f=1000 Ω.
   j.   Draw the pin diagram of IC 741 and name each pin.

2.   Answer **Any Six** Questions   6 x 5
   a.   Differentiate between avalanche and Zener break down. (any 5)
   b.   Define α, β and γ of a BJT and establish the mathematical relationship between them.
   c.   Describe the working of a Tunnel diode and draw its V-I characteristics.
   d.   Explain different types for transistor configurations and plot their input and output characteristics.
   e.   Differentiate between voltage and power amplifier. (any 5)
   f.   Draw and explainthe positive and negative clamper circuit with appropriate input and output waveforms.
   g   Explain operational amplifier stages.

3   Explain the working principle Full Wave Bridge rectifier with a neat circuit diagram and derive its rectification efficiency.   **10**

4   With neat diagram describe the working principle of RC coupled amplifier with its frequencyresponse curve.   **10**

5   Describe the need of transistor biasing and explain different methods of transistor biasing.   **10**

6   With neat sketch, explain the working of Class – A push pull amplifier.   **10**

7   Explain the operation of integrator and differentiator using OP-AMP with neat diagrams.   **10**