4TH SEM./ELECTRICAL./EEE/EE(INST. & CON.)/ 2024(S)

TH-2 Analog Electronics and OPAMP

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. Define Zener and Avalanche break down voltage.
   b. Mention the advantages of negative feedback.
   c. State Barkhausen criterion for sustained oscillation.
   d. Why FET is called unipolar device and BJT is called bipolar device?
   e. Define stabilization and stability factor.
   f. Draw the equivalent circuit of OP-AMP.
   g. Why CE configuration is most popular in amplifier circuit?
   h. List the characteristics of ideal OP-AMP.
   i. Define and classify transistor biasing.
   j. State the difference between voltage and power amplifier.

2. Answer **Any Six** Questions 6 x 5
   a. With a neat sketch explain the working of inverting and non inverting OP-AMP.
   b. State the function of filter circuit in rectifier? Explain the working of capacitor input filter.
   c. Explain the working of bridge rectifier and calculate
      (i) RMS current and voltage (ii) Ripple factor, (iii) Efficiency.
   d. Derive the relationship between the current amplification factor of transistor.
   e. Discuss the working of Zener diode and explain V-I characteristics.
   f. With neat diagram derive the of I_C *and* V_{CE} using voltage divider biasing method.
   g Define Oscillator and Explain the working of Wein bridge oscillator.

3 Describe all types of transistor configuration with input and output characteristics. 10

4 Explain the working of a integrator and differentiator and derive the expression for its output voltage. 10

5 Define DC drain resistance, AC drain resistance and trans-conductance of FET and explain the working of FET. 10

6 With neat diagram explain the working of a class B push pull amplifier with its frequency response curve. 10

7 What is clamping circuit? Explain the function of positive clamper and negative clamper. 10