

Final Assessment Test – April 2026



VIT
Vellore Institute of Technology
(Approved by the Council for Higher Education, India)

Course: BEEE208L - Analog Electronics

Class NBR(s): 2252 / 2257 / 2342

Slot: A1+TA1

Max. Marks: 100

Time: Three Hours

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Interpret the concepts of power amplifiers.
CO2	Compare and analyze the design aspects of differential amplifiers.
CO3	Design the frequency of oscillation for different oscillators.
CO4	Analyze the performance characteristics and applications of Op-Amp.
CO5	Design ADCs, DACs and timer circuits for engineering applications.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Obtain the maximum power and efficiency for a transformer coupled Class A CE amplifier with the following specifications: base fixed bias resistor $R_B = 1\text{ k}\Omega$, transistor $\beta = 25$, emitter resistor R_E is negligible, transformer primary : secondary turns ratio $a = 2$, $V_{BE(ON)} = 0.7\text{ V}$ and resistance of the load connected at transformer secondary $R_L = 20\text{ }\Omega$. CO1 BL3
 2. Explain the operation of a push-pull amplifier and discuss how Class-AB operation improves performance. CO1 BL1
 3. Derive the expression for the output voltage in terms of the input differential voltage for a BJT based differential pair and illustrate the relationship with appropriate plots. CO2 BL2
 - 4.a) In a Colpitts oscillator, the values of the inductors and capacitors in the tank circuit are $L = 40\text{ mH}$, $C_1 = 100\text{ pF}$ and $C_2 = 500\text{ pF}$ CO3 BL3
 - i) Find the frequency of oscillation.
 - ii) If the output voltage is 10 V , Find the feedback voltage.
 - iii) Find the minimum gain, if the frequency is changed by changing L alone.
 - iv) Find the value of C_1 for a gain of 10.
 - v) Also, find the new frequency.
- OR
- 4.b) Draw and explain operation of a RC Phase shift oscillator. Obtain an expression for the frequency of oscillation. CO3 BL3

- 5.a) For a non-inverting amplifier, $R_1 = 1 \text{ k}\Omega$ and $R_f = 10 \text{ k}\Omega$. Given: $V_{os} = 10 \text{ mV}$ and $I_B = 300 \text{ nA}$, $I_{os} = 50 \text{ nA}$.
- Calculate the maximum output offset voltage due to V_{os} and I_B .
 - Calculate the value of R_{comp} needed to reduce the effect of I_B .
 - Calculate the maximum output offset voltage if R_{comp} as calculated is connected in the circuit.

CO4 BL3

OR

- 5.b) Find V_o for the adder-subtractor shown in Fig. 1.

CO4 BL3

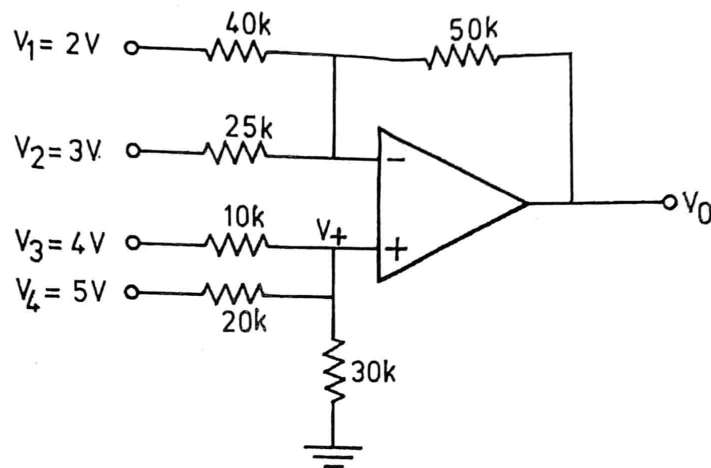


Fig. 1

- With neat figures describe the circuit using Op-Amp on the operation of Schmitt Trigger and draw its transfer characteristics, input and output curve.
- Describe in detail about the three-bit flash type analog to digital converter with neat block diagram.
- With help of neat sketch, explain the operation of the 4-bit binary weighted resistor DAC. Mention its advantages and disadvantages.
- Draw the internal block diagram of 555 IC and explain how it can be used as monostable multivibrator.
- With a neat circuit diagram, explain the working of fixed voltage regulator using 78XX and list its advantages and disadvantages.

CO4 BL3

CO5 BL1

CO5 BL2

CO5 BL1

CO5 BL2

⇔⇔⇔ U/D/TZ ⇔⇔⇔