



AJEENKYA

D Y PATIL UNIVERSITY

End Term Examination (December 2019)

School: School of Engineering

Program: M.Tech Bioengineering (BM)

Course: Integrated Circuit Design for Bioinstrumentation Course Code: BEN503

Semester: I

Max Marks: 40

Duration (mins): 90

PART-A

(Write Very Short / One Line Answer)

Note: Answer all questions. Each question carries 1 mark. [10]

1. What is SVRR?
2. What is the input offset voltage?
3. Write the output voltage expression of inverting configuration.
4. Define slew rate.
5. Draw the circuit diagram of differentiator.
6. Draw the circuit diagram of Wein bridge oscillator.
7. What is PLL?
8. Write the application of oscillator.
9. Draw the output voltage waveform of half wave rectifier.
10. What is CMRR?

PART-B

(Short Answer Questions – Not More Than 150 Words)

Note: Answer any FOUR questions. Each question carries 5 marks. [20]

11. Draw the circuit diagram of an inverting amplifier. Derive the output voltage of an inverting amplifier in terms of input voltage and resistances.
12. Define the following terms:
(a) virtual ground (b) input offset voltage (c) input offset current
13. Prove that $V_o = A_d V_d \left(1 + \frac{1}{\rho} \frac{V_c}{V_d}\right)$

14. Explain the non-inverting comparator in detail.
15. In a Schmitt trigger circuit, $R_1 = 10 \text{ k}\Omega$, $R_2 = 5 \text{ k}\Omega$ and $V_{in} = 10 \sin\omega t$. Saturation voltage $\pm 15\text{V}$. Determine the V_{UT} and V_{LT} and hysteresis width.
16. Write the advantages and disadvantages of the Wein bridge oscillator.

PART-C

(Long/Case Study/Essay Type Answer Questions)

Note: Answer any ONE question. Each question carries 10 marks. [10]

17. Draw the Wein bridge oscillator using OP-AMP and RC bridge circuit and derive an expression for the frequency of oscillation.
18. Explain the following with an example.
(a) clipper and clamper (b) sample and hold circuit