

End Term Examination (December 2018)

School: School of Engineering

Program: B.Tech (Mechatronics)

Course: Analog and Digital Electronics

Course code: ENG205

Semester: III

Max Marks: 40

Duration (mins) : 120

PART-A

(Write Very Short / One Line Answer)

Note: Answer all questions. Each question carries 1 mark.

[10]

1. What is β of a transistor?
2. Write the relation between α and β ?
3. Write the output voltage expression of non-inverting terminal.
4. Define CMRR.
5. Draw the circuit diagram of an integrator.
6. Draw the circuit diagram of Wein Bridge oscillator.
7. Write the truth table of NAND gate.
8. Write the application of oscillator.
9. What is flip flop?
10. What is register?

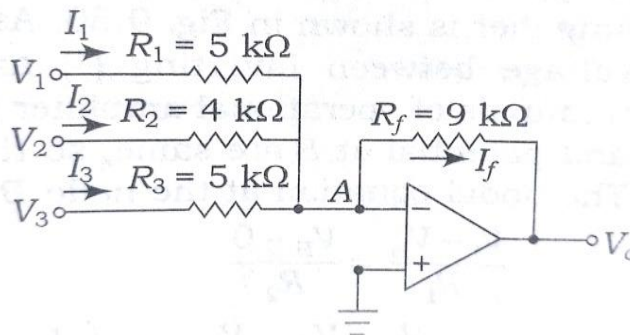
PART-B

(Short Answer Questions – Not More Than 150 Words)

Note: Answer any four questions. Each question carries 5 marks

[20]

11. An operational amplifier circuit is shown in figure. Determine the output voltage V_o and current flow through R_1 , R_2 , R_3 and R_f . Assume $V_1 = 2\text{ V}$, $V_2 = -2\text{ V}$ and $V_3 = 3\text{ V}$.



12. Define the following terms (a) CMMR (b) slew rate (c) virtual ground (d) input offset voltage and input offset current
13. Prove that $V_o = A_d V_d \left(1 + \frac{1}{\rho} \frac{V_c}{V_d}\right)$

14. What are the different types of biasing? Derive the stability factor of voltage divider biasing circuit
15. Explain half adder and full adder in details.
16. Explain the S R flip flop in details.

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. Find the output expression and draw the digital circuit of it.
 - (a) $f(A, B, C, D) = \sum m(1, 3, 7, 11, 15) + d(0, 2, 5)$
 - (b) $f(A, B, C, D) = \prod M(4, 5, 6, 7, 8, 12) \cdot d(1, 2, 3, 9, 11, 14)$