Register No.: ……. Name: ……..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTERB.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022
ROBOTICS AND AUTOMATION
(2020 SCHEME)

Course Code: **20RBT203**

Course Name: **Electronic Devices and Circuits**

Max. Marks: **100** **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Design a circuit which is used to remove negative half cycle of the input signal.
2. Explain Q point.
3. Why FET is called voltage controlled device?
4. Compare MOSFET with JFET.
5. List the coupling schemes used in multistage amplifiers?
6. What is the impact of negative feedback on noise in amplifier circuits?
7. State Barkhausen criterion for sustained oscillation. What will happen to the oscillation if the magnitude of the loop gain is greater than unity?
8. Draw and explain the block diagram of OP AMP.
9. Draw the block diagram of IC555 Timer.
10. List out the various stages through which PLL operates.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Draw and explain DC load line. (7)
    b) Explain the working of diode compensation technique circuit for I_{CO}. (7)

OR

12. What is the need of biasing? Explain fixed bias and voltage divider bias in BJT. (14)

MODULE II

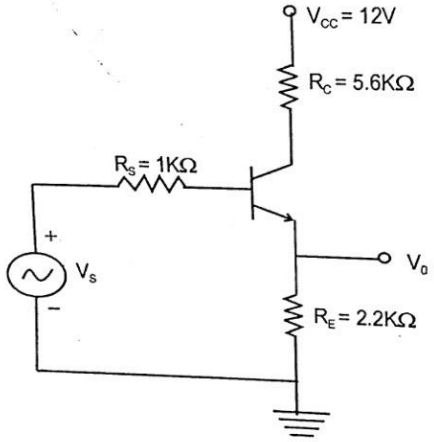
13. a) Analyze common source amplifier using small signal equivalent model. (7)
    b) What is Miller's theorem? Explain and prove it. (7)

OR

14. Derive the expression for input resistance and output admittance for hybrid pi common emitter transistor model. (14)

MODULE III

15. Determine D, Avf, Rif, Rof and R'of for the given circuit by identifying topology. (14)



OR

16. Explain the operation of the class B push pull power amplifier with neat diagram and list its advantages. (14)

MODULE IV

17. a) Draw the circuit of Hartley oscillator and explain its working. Derive the expressions for frequency of oscillation and condition for starting of oscillation. (10)

    b) In an Hartley oscillator has if L_1 = 5mH, L_2 = 25mH and the frequency of its oscillation ranging from 700 KHz to 1 MHz. Determine the value of C over this frequency range. (4)

OR

18. a) Draw the circuit diagram of a Wien bridge oscillator using BJT and derive the expression for frequency of oscillation. Explain how Bark Hausen's criterion is satisfied in Wien bridge oscillator. (9)

    b) Design a circuit to obtain the output, $V_0 = -4V_1 - 5V_2 - V_3$. (5)

MODULE V

19. a) Explain the working of PLL with neat block diagram. (6)

    b) Explain how switching take place at UTP and LTP in a Schmitt trigger also plot the hysteresis curve. (8)

OR

20. a) Explain the working of integrator circuit using operational amplifier. (7)

    b) Explain the working of triangular wave generator circuit using operational amplifier. (7)

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