B **515B3** **Total pages: 2**

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SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R,S), MAY 2024

Electronics and Communication Engineering

(2020 SCHEME)

Course Code : 20ECT202

Course Name : Analog Circuits

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

PART A

(Answer all questions. Each question carries 3 marks)

1. Write the conditions for low pass RC circuit act as a integrator.
2. Prove that in fixed bias stability factor is 1+ß.
3. Explain Miller's capacitance.
4. What is the function of emitter bypass capacitor in CE amplifier?
5. How MOSFET can be configured as PN juction diode?
6. What impact does cascading have on the bandwidth of a multistage amplifier?
7. In a Hartley Oscillator L_1=0.3mH, L_2 = 0,3mH and C=0.003µF. Calculate the frequency of oscillation.
8. Calculate the value of the capacitor required to build a LC oscillator that uses an inductance of L = 1mH to produce a sine wave of frequency 1 GHz.
9. Explain the need of foldback current limiting.
10. What are the advantages of push pull amplifier circuit?

PART B

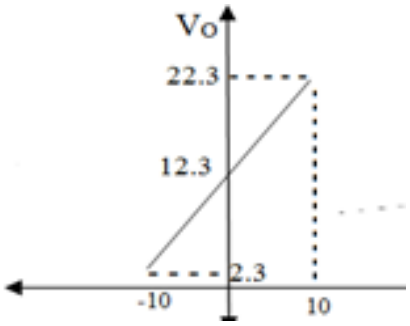
(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. (a)Design a clipper circuit to clip at +3V and -3V for a sine wave input of 10 V peak voltage. 7
    (b) Derive the transfer function of high pass RC circuit. 7

OR

12. (a)Explain the applications of clamping circuit. 5
    (b)Design a clamper circuit to get the following transfer characteristics, assuming voltage drop across the diode is 0.7 V. 9



MODULE II

13. (a)Explain the concept of small signal analysis using the hybrid-pi model in the context of a common emitter (CE) configuration amplifier. 9
(b)State and prove Miller's theorem. 5

OR

14. (a)Analyse the high frequency response of common emitter (CE) configuration amplifier. 7
(b)Explain the frequency response curve of RC coupled amplifier 7

MODULE III

15. Analyse common source amplifier circuit using small signal model. 14

OR

16. Analyse common source amplifier circuit with diode connected load using small signal model. 14

MODULE IV

17. Analyse BJT amplifier circuit which uses voltage series feedback. 14

OR

18. (a)What are different feedback topologies? Explain how the current series feedback affect the input and output impedances. 8
(b)Explain the working of a crystal oscillator. 6

MODULE V

19. (a)Explain the classification of power amplifer based on the collector current flow. 8
(b)Compare transistor series voltage regulator and transistor shunt voltage regulator circuits. 6

OR

20. (a)Sketch the circuit diagram of a transistor series voltage regulator and explain its working. 9
(b)A shunt regulator using a single transistor and a zener diode is required to maintain output voltage constant at 10 V.The load current is limited to 100 mA,input voltage varies from 11.25 to 13.75 V and V_{BE}=0.4 V.Design the circuit. 5

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