R19

II B. TECH II SEMESTER REGULAR EXAMINATIONS, AUGUST 2021
ANALOG CIRCUITS
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

Note: Answer **ONE** question from each Unit (**5 × 12 = 60 Marks**)
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UNIT – I

1. a) What is the relation between reactance and resistance of RC low pass filter at its upper 3dB frequency? [4M]

    b) A square wave whose peak to peak value is 1V and is symmetrical with respective to ground operating at a frequency of 5Hz. This voltage is impressed upon the RC differentiating circuit whose time constant is 0.2 sec. What are the steady state minimum and maximum values of the output voltage? [8M]

(OR)

2. a) State and prove clamping circuit theorem. [6M]

    b) Explain about Positive clampers with neat sketch and necessary equations. [6M]

UNIT – II

3. a) Discuss the need of cascading amplifiers. [4M]

    b) Derive expression for overall β and overall input impedance of a darlington pair with individual transistor gains given as $\beta 1$ and $\beta 2$. Assume the parameters required. [8M]

(OR)

4. a) Derive the expressions for the following hybrid-Π conductances. [6M]

    (i) g_m (ii) $g_{b'e}$ (iii) $g_{b'c}$ (iv) g_{ce}

    b) What is the relation between f_T and f_β of a CE amplifier? Discuss the significance of f_T. [6M]

UNIT – III

5. a) What are the advantages and disadvantages of negative feedback? [4M]

    b) Draw the circuit diagram of current shunt feedback and derive the expression for the input and output impedance. [8M]

(OR)

6. a) Explain the sampling and mixing networks. [6M]

    b) An amplifier requires an input signal of 60mV to produce a certain output. With a negative feedback to get the same output, the required input signal is 0.5V. the voltage gain with feedback is 90. Find the open loop gain and feedback factor. [6M]

UNIT –IV

7. a) What are the advantages of crystal oscillators? [2M]

    b) Derive the expression for frequency of oscillation in a hartley oscillator. [10M]

8. a) Explain the classification of feedback oscillators?   [4M]

    b) In a transistorized Hartley oscillator, the inductances values employed are 2mH and   [8M]
        20µH while the frequency is to be changed from 950KHz to 2050KHz. Calculate
        the range over which capacitor is to be varied.

UNIT –V

9. a) Differentiate between power amplifiers and voltage amplifiers.   [4M]

    b) Derive an expression for conversion efficiency of a class B power amplifier in push   [8M]
        pull configuration.

<div align="center">(OR)</div>

10. a) What are the applications of tuned amplifiers?   [4M]

    b) Derive the expression for the bandwidth of a single stage tuned amplifier?   [8M]

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