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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations October-2022

ELECTRONIC CIRCUIT ANALYSIS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

- 1 a Explain various methods used for coupling of multistage amplifiers with their frequency response. **L2 6M**
- b Construct the block diagram of n-stage cascade amplifier and analyze its various parameters. **L2 6M**

OR

- 2 a With diagram, deduce the expressions for Voltage gain, current gain, Input and output resistances of a Cascade amplifier. **L2 6M**
- b Short circuit CE current gain of a transistor is 25 at a frequency of 2MHz. If $f\beta = 200\text{KHz}$, Calculate (i) f_T (ii) h_{fe} (iii) Find $|A_i|$ at frequency of 10MHz and 100MHz. **L3 6M**

UNIT-II

- 3 a List the characteristics of negative feedback amplifiers. **L1 6M**
- b Analyze the effect of negative feedback on Output resistance for Voltage series and Current series feedback amplifier. **L4 6M**

OR

- 4 a Show that the bandwidth of an amplifier can be improved by using negative feedback. **L2 6M**
- b A voltage series negative feedback amplifier has a voltage gain without feedback of $A = 500$, input resistance $R_i = 3\text{k}\Omega$, output resistance $R_o = 20\text{k}\Omega$ and feedback ratio, $\beta = 0.01$. Calculate the voltage gain A_f , input resistance R_{if} , and output resistance R_{of} of the amplifier. **L3 6M**

UNIT-III

- 5 a Determine the condition for sustained oscillations for an RC phase shift Oscillator with necessary circuit diagrams. **L3 6M**
- b Design an RC phase shift oscillator to generate 5 KHz sine wave with 20 V peak to peak amplitude. Draw the designed circuit. Assume $h_{fe} = 150$. **L3 6M**

OR

- 6 a Explain the working of a Crystal oscillator and sketch its characteristics. **L3 6M**
- b In a transistorized Hartley oscillator, the two inductances are 2 mH and 20 μH while the frequency is to be changed from 950 KHz to 2050 KHz. Calculate the range over which the capacitor is to be varied. **L3 6M**

UNIT-IV

- 7 a With neat diagram, explain Series fed directly coupled Class A Power Amplifier and determine its maximum efficiency. **L3 6M**
- b A Class B push pull amplifier drives a load of 16Ω , connected to the secondary of ideal transformer. The V_{cc} is 25V. If number of turns on primary is 200 and secondary is 50. Determine maximum power output, DC power input and efficiency. **L3 6M**

OR

- 8 a Compare different types of tuned amplifiers. **L2 6M**
- b The bandwidth of a single tuned amplifier is 20 kHz. Determine the bandwidth if three such stages are cascaded. Also calculate the bandwidth for four stages. **L3 6M**

UNIT-V

- 9 a Deduce the expression for time period, T in Astable multivibrator. **L1 6M**
- b Explain the operation of Emitter Coupled Monostable multivibrator. **L2 6M**

OR

- 10 a Why triggering is needed for multivibrators? Explain a triggering method for monostable multivibrator. **L2 6M**
- b Design and draw a saturated collector coupled monostable multivibrator for the following specifications: $V_{CC} = 10\text{ V}$, $V_{BB} = -5\text{ V}$, pulse duration = 12ms, $I_{C(ON)} = 2\text{ mA}$ and two NPN transistors with minimum $h_{fe} = 100$ and $I_{CBO} = 0$. **L3 6M**

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