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

B.Tech II Year I Semester Regular Examinations May-2022

ANALOG ELECTRONIC CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

1. a What is feedback Amplifier? Illustrate the basic concept of Feedback amplifier with suitable block diagram. L1 6M
- b An amplifier has open loop gain 1000 and feedback ratio of 0.04, if the open loop gain changes by 10% due to temperature, find the percentage change in the gain of the amplifier feedback. L3 6M

OR

2. a Show that negative feedback reduces gain of an Amplifier. L3 6M
- b An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, solve the value of open-loop gain, A and feedback ratio, β . L4 6M

UNIT-II

3. a What is an Oscillator? Explain the principle of operation of an oscillator. L1 6M
- b Design a RC phase shift oscillator to generate 5 KHz sine wave with 20V peak to peak amplitude. Draw the designed circuit. Assume $h_{fe} = 150$. L5 6M

OR

4. a In a transistorized Hartley oscillator, the two inductances are 2 mH and 20 μ H while the frequency is to be changed from 950 KHz to 2050 KHz. Find the range over which the capacitor is to be varied. L4 6M
- b Explain the working principle of Wein-bridge oscillator using BJT and derive its frequency expression for sustained oscillations. L3 6M

UNIT-III

5. a What is frequency compensation and explain how the frequency response is varied with respect to Compensation network? L1 6M
- b Derive the voltage gain of non-inverting op-amp. L3 6M

OR

6. a What is frequency compensation? Explain how the frequency response is varied with respect to Compensation network. L1 6M
- b An op-amp has a slew rate of 2V/ μ s. What is the maximum frequency of an output sinusoidal its peak value of 5V at which the distortion sets in due to the slew rate limitation? L4 6M

UNIT-IV

7. a Design an inverting adder circuit using an op-amp to get the output expression as $V_o = -(0.1V_1 + V_2 + 10V_3)$, Where V_1 , V_2 and V_3 are the inputs. L5 6M
- b Explain the operation of differentiator using op-amp with a neat circuit diagram. L2 6M

OR

- 8 a Explain the operation of integrator using op-amp with a neat circuit diagram. **L2 6M**
- b Calculate the frequency of oscillation for an astable multivibrator having $R_2=10$ kohm, $R_1=8.6$ kohm, $R_f=100$ kohm and $C=0.01 \mu F$. **L4 6M**

UNIT-V

- 9 a Explain the first order low pass butter worth filter with a neat circuit diagram. **L2 6M**
- b Design an inverted R-2R ladder DAC for digital input word 001. **L5 6M**

OR

- 10 a Draw the circuit diagram of Dual Slope ADC and explain its working with neat sketches. **L4 6M**
- b Design a low pass filter at a cut-of frequency of 15.9kHz with pass band gain of 1.5 and draw the frequency response. **L5 6M**

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UNIT-III

UNIT-IV