Total No. of printed pages = 5

19/3rd Sem /UECE515C

2021

LINEAR ICs AND SYSTEM

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Mention at least 5 parameters to be considered while choosing op-amp for a given application. 5

   (b) Implement a current controlled current source using op-amp. 5

   (c) Draw the simplified circuit diagram of 741 op-amp and find the expression for small signal voltage gain. 5+5=10

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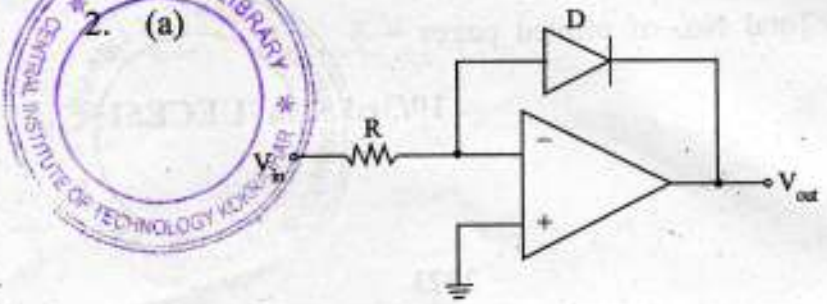
2. (a)

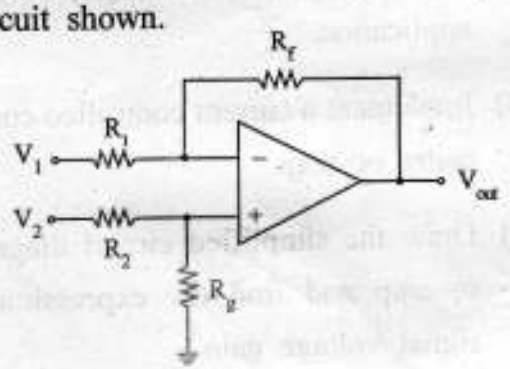


Prove that the output voltage has logarithmic dependence on input voltage. 5

(b) Draw the circuit diagram of an inverting Schmidtt trigger circuit and explain its operation and draw the input sine wave and output wave. 10

(c) Draw the circuit diagram for a PWM generator using comparator and explain its operation with input and output waveform. 5

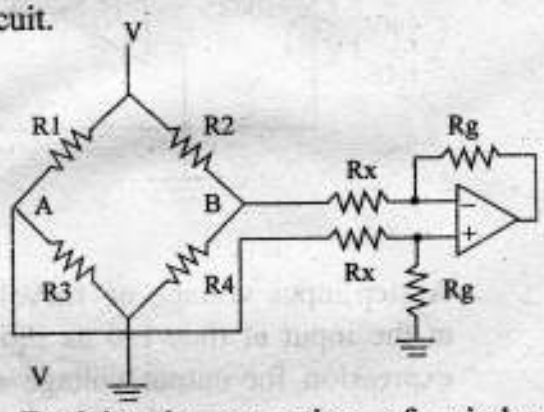
3. (a) Find the expression for output voltage in the circuit shown. 10



(b) Cite the differences between Op-amp and comparator. 5

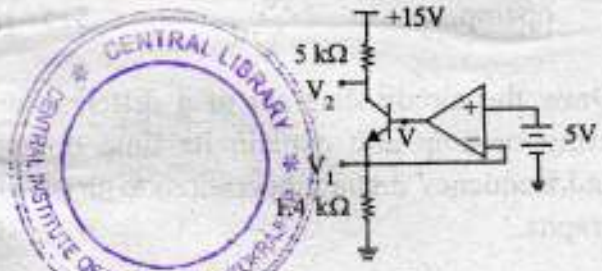
(c) Design a VCVS such that it offers a gain of 10V/V with 10 kΩ input resistance. 5

4. (a) If R1=9.9KΩ, R2=11.1kΩ, R3=11.1KΩ, R4=9.9kΩ, Rx=1kΩ, Rf=10kΩ, V=1V, find the output voltage from the following circuit. 5



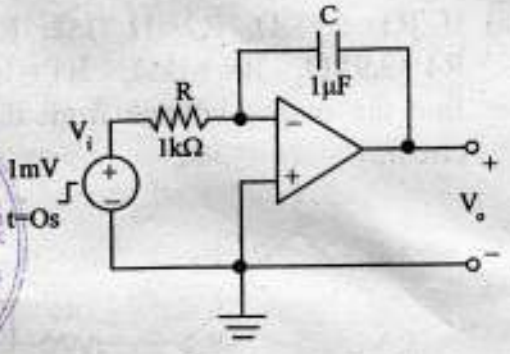
(b) (i) Explain the operation of windowing comparator with proper diagrams and waveforms. Mention few applications of this circuit. 8+2=10

(ii) Find the voltage at V_2 and V_1 if β =100. 5



5. (a) Explain the operation of a half wave precision rectifier and draw the input and output waveforms. 6

(b)



A step-input voltage of 1mVolt is applied at the input at time t=0 as shown. Find the expression for output voltage and draw the input and output voltage. 4

(c) (i) Draw the circuit diagram of an anti-log amplifier and derive the expression for output voltage.

(ii) Explain the operation of a CCCS using opamp. 5+5=10

6. (a) Draw the circuit diagram of a differentiator using op-amp and explain its time domain and frequency domain operations with proper graphs. 6+4=10

(b) An operational amplifier is required to amplify a signal with a peak voltage of 5 volts at a frequency of 5 kHz. Find out a slew rate. 5

(c) Write a short notes on : 5

(i) CMRR

(ii) input offset voltage.