

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 131526

Roll No.

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B.TECH.

(SEM. V) THEORY EXAMINATION, 2015-16

ANALOG INTEGRATED ELECTRONICS

[Time:3 hours]

[Total Marks:100]

SECTION-A

1. Attempt **all** parts . All parts carry equal marks. Write answer of each part in short . (2x10=20)
 - (a) Draw & Explain pin diagram of IC-741 op-amp.
 - (b) What do you mean by Switching Regulator?
 - (c) Discuss the frequency response of IC-741.
 - (d) What are active filters?
 - (e) Write down the expression of gain for inverting amplifier.
 - (f) Enlist the characteristics of an Ideal op-amp.
 - (g) Enlist the advantages of active filters over passive filters.

- (h) Design Multiplier Circuit? Enlist any three applications of multiplier circuit.
- (i) Define Capture-range and Lock-in-range of PLL.
- (j) Design Full Wave Precision Rectifier?

SECTION-B

Attempt **any five** questions from this section. (10x5=50)

- What do you mean by Differential Amplifier? Explain the operation of a basic differential amplifier. Calculate the Output Voltage of Difference amplifier with inputs 0.5mV and 0.45mV. Given $A_d=4500$ and $CMRR=10000$.
- Find the expression for Output Voltage for a Non-Inverting Integrator.
- Draw the circuit diagram of Anti-log amplifier and find the expression for output voltage.
- How Schmitt trigger can be used for square waveform generation. Also draw the Hysteresis diagram.
- List the characteristics of an operational trans-conductance amplifier(OTA). Draw the inverting and non-inverting amplifier using OTA.
- Draw the circuit diagram of All Pass Filter and show that phase is given by $\phi = -2 \tan(2\pi fRC)$.

- What is the stability of an Op-amp? Explain the various stability specifications with constant gain bandwidth product.
- Explain Voltage to frequency converter with diagram.

SECTION-C

Attempt **any two** questions from this section. (15x2=30)

- Draw the circuit diagram of a Triangular wave generator using IC 741 and explain its working with proper mathematical expression.
- With the help of neat diagram analyze the circuit of Instrumentation amplifier. How it is superior to conventional differential configuration.
- Mention the designing criteria of a 2nd order low pass filter. Design a 2nd order Butterworth Low pass filter with overall pass band gain of 3 having corner frequency 2KHz. Also find and plot the frequency response at 100Hz, 500Hz, 1000Hz, 1500Hz, 2000Hz, and 5000Hz.

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