E & TC Sem IV

B.Tech. SEM -IV E & TC 2014 Course (CBCS) : SUMMER - 2019

SUBJECT: LINEAR INTEGRATED CIRCUITS

Day : Thursday
Date: 23/05/2019

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

S-2019-2635

N.B.:

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Draw the diagrams wherever necessary.
4) Assume suitable data, if necessary.

Q.1 **a)** What do you mean by offset voltage? How to compensate offset voltage? **(06)**

b) The 741 C is used as inverting amplifier with a gain of 50. The sinusoidal input voltage has a variable frequency and max. amplitude of 20 mV peak. What is the maximum frequency of input at which output will be undistorted? Assume that amplifier is initially nulled. **(04)**

OR

a) Define – i) CMRR ii) input offset current iii) input bias current. **(06)**

b) Draw and explain block diagram of IC 741C. **(04)**

Q.2 **a)** Design a summing amplifier to add 3 DC input voltage. **(06)**

b) Determine output voltage for open loop differential amplifier with first input voltage = 10 mV (RMS), second input voltage = 20 mV (RMS). Draw output waveforms.

OR

a) Explain use of Op-Amp as differentiator. Draw diagram and derive necessary equation. **(06)**

b) Instrumentation amplifier uses a strain gauge and has following specifications. Unstrained resistance of each of 4 elements of strain gauge is 120Ω, Vdc = 5V and Op-Amp supply voltage = ± 10 V, R_1 = 100Ω, R_f = 47KΩ. Determine output voltage If change in resistance of each strain gauge element is 0.1Ω. **(04)**

Q.3 **a)** For Schmitt trigger, R_1 = 150Ω , R_2 = 68 kΩ, Vin = 500mV_{pp} sine wave and saturation Voltage = ± 14 V. Determine threshold voltage and hystersis voltage. Also draw the output waveform. **(06)**

b) Derive the equations for output voltage of log amplifier. **(04)**

OR

a) Draw and explain circuit and waveforms of precision rectifier. **(06)**

b) Write a short note on Hystersis. **(04)**

Q.4 **a)** Design a first order wide band pass filter with f_L = 400 Hz and f_H = 2kHz. And pass band gain = 4. **(06)**

b) What are advantages of active filters over passive ones? What is butterworth response? **(04)**

OR

a) Design second order high pass filter having cutoff frequency 2kHz. **(06)**

b) Draw and explains square wave generator. **(04)**

Q.5 **a)** Draw and explain block diagram of 555 timers. **(06)**

b) What is the role of low pass filter and VCO in PLL? **(04)**

OR

a) Design astable multivibrator using 555 having output frequency of 10kHz with 25% duty cycle. **(06)**

b) List application of PLL. Explain any one application of PLL. **(04)**

Q.6 **a)** Explain construction and working of V to I convertor. **(06)**

b) Explain construction and working of D to A convertor using R-2R ladder. **(04)**

OR

a) Explain construction and working of A to D convertor using successive approximation. **(06)**

b) Explain construction and working of I to V convertor. **(04)**

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