## R13

III B. Tech I Semester Supplementary Examinations, October/November -2018 LINEAR \& DIGITAL IC APPLICATIONS
(Electrical and Electronics Engineering)
Time: 3 hours
Max. Marks: 70

Note: 1. Question Paper consists of two parts (Part-A and Part-B)<br>2. Answering the question in Part-A is compulsory<br>3. Answer any THREE Questions from Part-B

PART - A
1 a) Explain the significance of level translator
b) Define CMRR and PSRR.
c) What is an instrumentation amplifier?
d) Draw the block diagram of a PLL?
e) What are the advantages of active filters over passive filters?
f) Define the terms Conversion time, Percentage resolution related to ADC.

## PART -B

2 a) Draw the circuit diagram of a basic differential amplifier and explain its transfer characteristics.
b) Draw the circuit diagram of dual input unbalanced output differential amplifier and derive the expression for dc analysis.
3 a) Discuss briefly about the DC characteristics of ân operational amplifier?
b) Define the terms: SVRR, Input bias current, Input offset voltage, Gain bandwidth product.

4 a) With a neat sketch explain the principle of operation of Antilog amplifier.
b) Design a differentiator to differentiate an input signal that varies in frequency from 100 Hz to 10 KHz . If a sine wave of 1.2 V Peak at 10 KHz is applied to the differentiator of part, draw its output wave form.
5 a) Why the name was given to 555 Timer. Draw monostable multivibrator using 555 Timer and explain the operation.
b) Design an Astable multivibrator having an output frequency 15 KHz with duty cycle of $40 \%$.

6 a) With neat circuit diagram explain the operation of $2^{\text {nd }}$ order butter worth HPF and derive an expression for voltage gain.
b) Design a Band Pass filter with $\mathrm{fc}=1 \mathrm{KHz}, \mathrm{Q}=3$ and $\mathrm{A}_{\mathrm{f}}=10$. Draw the circuit with all the components.

7 a) Draw the schematic circuit diagram of dual-slope $A / D$ converter and explain its operation. Derive expression for output voltage.
b) Define important performance specifications of Digital to Analog converters and list their typical values.

