Code No: RT31042   (R13)   (SET - 1)

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2017
LINEAR IC APPLICATIONS
(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering and Electronics and Computer Engineering)

Time: 3 hours   Max. Marks: 70

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

1	a)	Draw the equivalent circuit for practical op amp.	[3M]
	b)	List out AC and DC characteristics of operational amplifiers.	[4M]
	c)	What are the applications of V-I and I-V converters?	[3M]
	d)	Design a first order LPF for Cut-off frequency 1KHz and pass band gain 2.	[4M]
	e)	Draw a pin configuration for 555 IC Timer.	[4M]
	f)	Define accuracy and resolution of the DACs.	[4M]

PART -B

2	a)	What is the significance of level shifter?	[4M]
	b)	Derive an expression for voltage gain for dual input balanced output differential amplifier.	[8M]
	c)	Distinguish between AC and DC analysis in amplifiers.	[4M]
3	a)	Draw the generalized block diagram for the operational amplifier. Explain each block in detail	[8M]
	b)	Define i) CMRR ii) PSRR iii) DRIFT iv)Output offset voltage.	[8M]
4	a)	With neat sketch explain the operation of OP amp Integrator circuit.	[8M]
	b)	Explain the operation of the instrumentation amplifier.	[8M]
5	a)	Explain the operation of All pass filter with a neat diagram.	[10M]
	b)	With neat sketch explain the operation of IC 1496 balanced modulator.	[6M]
6	a)	Draw and explain the basic block diagram of the PLL .	[6M]
	b)	What is VCO ,draw and explain the functional block diagram of VCO	[10M]
7	a)	In detail how the digital information converted into analog information by using 4bit binary weighted resistor method.	[8M]
	b)	Give short notes on successive approximation ADC.	[8M]

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Code No: RT31042   **R13**   SET - 2

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2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What is the purpose of Level translator in op amp?	[3M]
	b)	Draw the pin configuration of the IC 741C	[4M]
	c)	What are the applications of integrator and differentiator	[4M]
	d)	Define capture range and Lock range in PLL.	[4M]
	e)	What is the significance of All pass filter?	[3M]
	f)	An 8bit DAC has final out put reading of the 5.55V with input of 1111, find the resolution and output voltage.	[4M]

PART -B

2.	a)	Derive the Differential Amplifier- AC analysis of single input dual output Configuration in detail.	[8M]
	b)	Explain the IC 741 op-amp block diagram & its features in detail.	[7M]
3	a)	List out the applications and temperature ranges of IC 7410 op amp.	[3M]
	b)	Explain the Frequency Compensation techniques of op-amp in detail.	[7M]
	c)	Define the following i)Input offset voltage ii) Slew rate iii)Bias circuit	[5M]
4	a)	Derive the output expression for the practical integrator circuit.	[7M]
	b)	Derive frequency of oscillations by using triangular wave generator.	[8M]
5	a)	Draw the circuit diagram of All pass filters and derive its output response.	[8M]
	b)	Draw the 2nd order band pass filter and explain its operation in detail.	[8M]
6	a)	Draw the block diagram of Astable operations using IC 555 and derive its time Constant.	[8M]
	b)	Draw the circuit diagram of VCO 566 and explain its operation.	[8M]
7	a)	Draw the circuit diagram of counter type ADC and explain its operation in detail.	[8M]
	b)	Explain the operation of R-2R ladder 4 bit DAC with step output waveforms.	[8M]

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Code No: RT31042   **R13**   SET - 3

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Time: 3 hours   Max. Marks: 70

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2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What are the ideal characteristics of the op-amp?	[3M]
	b)	Derive an expression for CMRR.	[4M]
	c)	What are the advantages of IC over discrete circuits?	[3M]
	d)	What are the applications of Analog switches?	[4M]
	e)	Define PLL and list out the applications of the PLL.	[4M]
	f)	What are the different techniques for DAC?	[4M]

PART -B

2	a)	What is the significance of coupling? Explain about DC coupling.	[5M]
	b)	Give DC and AC analysis for dual input balanced output differential amplifier.	[10M]
3	a)	What is op amp? Draw the ideal and practical characteristics of op amp	[3M]
	b)	What are the important parameters of op amp, explain them in practical view.	[8M]
	c)	Describe the input offset compensating network for inverting op amp.	[5M]
4	a)	What is the output voltage of integrator when step input voltage of 5V with 5ms is applied	[8M]
	b)	Explain the operation of precession rectifiers with neat sketch.	[8M]
	c)	Explain the principal of operation of comparator.	
5	a)	Explain the operation of narrow band reject filter with characteristics.	[8M]
	b)	Draw the block diagram of four quadrant multiplier and explain its operation in detail.	[8M]
6	a)	Draw and Explain the principles and description of individual blocks of PLL in detail.	[8M]
	b)	Explain the terms frequency multiplication, frequency translation of PLL	[8M]
7	a)	Describe the operation of the dual slope ADC.	[8M]
	b)	Compare the characteristics and specifications of ADC and DACs.	[8M]

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Code No: RT31042   **R13**   SET - 4

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Time: 3 hours   Max. Marks: 70

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

1	a)	Draw the configuration of single input unbalance output differential amplifier.	[3M]
	b)	Define slew rate? Give typical value for 741C Op-amp.	[4M]
	c)	Explain why an open-loop Op-amp is unsuitable for linear applications?	[3M]
	d)	Draw the circuit of sample and hold amplifier.	[4M]
	e)	Draw the block diagram of PLL and list out each block name.	[4M]
	f)	Define conversation time and settling time in ADC and DAC.	[4M]

PART -B

2	a)	What is the main advantage of constant current bias over emitter bias in differential amplifiers?	[4M]
	b)	Derive an expression for voltage gain for dual input unbalanced output differential amplifier.	[8M]
	c)	Draw the configuration for difference amplifier.	[4M]
3	a)	Differentiate between ideal and practical op amp specifications.	[3M]
	b)	An op-amp has a slew rate of 2V/µs. What is the maximum frequency of an output sinusoid of peak value 5V at which the distortion sets in due to the slew rate limitation	[8M]
	c)	List out the different types of integrated circuits and their package types.	[4M]
4	a)	Explain the operation of a grounded load V to I converter using op-amp.	[8M]
	b)	Explain the monostable multivibrator operation by using op amp.	[8M]
	c	Design a practical op-amp differentiator circuit for the frequency of 1KHz and explain its frequency response.	
5	a)	Design the 2nd order HPF and explain its operation in detail.	[8M]
	b)	Draw the 2nd order band pass filter and explain its operation in detail.	[8M]
6	a)	Explain the monostable operation of 555 IC timer with neat sketch.	[8M]
	b)	With a clear block diagram explain frequency multiplier using PLL.	[8M]
7	a)	Draw the circuit diagram of dual slope ADC and explain its operation.	[8M]
	b)	What are the draw backs of weighted resistor DAC? How they can be overcome by using R-ZR ladder DAC.	[8M]

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