R18

Code No: 154BH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, February -2024

LINEAR IC APPLICATIONS

(Common to ECE, EIE)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Draw the equivalent circuit of an ideal OP-AMP.	[2]
b)	What is the importance of DC coupling in Op-amp internal structure?	[3]
c)	Explain how comparator is used as level detector.	[2]
d)	What are the limitations of the basic differentiator circuit?	[3]
e)	Explain relationship between Q and bandwidth of a bandpass active filter.	[2]
f)	Write down the advantages, disadvantages and applications of Hartley oscillator.	[3]
g)	Define capture range and Lock range in PLL.	[2]
h)	Draw a pin configuration for 555 IC Timer.	[3]
i)	Define accuracy of the DACs.	[2]
j)	Which is the fastest ADC and why it is so?	[3]

PART – B

(50 Marks)

2.a) Design an inverting amplifier with a gain of -10 and input resistance of 10kΩ.

b) With a neat sketch explain the frequency response of a 741 op-amp. [5+5]

OR

3.a) Explain the terms (i) slew rates (ii) PSRR and list out ideal and practical characteristics of above parameters.

b) Discuss in detail the cascaded differential amplifier stages. [5+5]

4.a) How OP-AMP is used as Comparator? Explain its working.

b) Explain the operation of Op-Amp as an Integrator. [5+5]

OR

5.a) Sketch Schmitt trigger using Op-Amp and explain its characteristics.

b) Explain the difference amplifier using IC 741 and explain its operation. [5+5]

6.a) Design a first order low pass filter for a high cut-off frequency of 2 kHz and Pass band gain of 2.

b) Explain the operation of 2nd order band reject filter along with circuit diagram. [5+5]

OR

7. Explain the functional operation and derive the expression for frequency of oscillation of a RC phase shift oscillator. [10]

8. Design a monostable multivibrator using 555 timer to produce a pulse width of 100 m sec. [10]

OR

9. Explain the working of PLL. Explain in detail FSK demodulator using PLL. List out the applications of the PLL. [10]

10. Draw the circuit of a weighted resistor DAC and derive expression for output analog voltage Vo. [10]

OR

11. Determine the output voltages caused by each bit in a 6-bit ladder if the input levels are 0=0v and 1=+16V. Determine the resolution and full-scale output of this circuit. Find out the voltage from the above ladder for a digital input of 101011. [10]

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