R16

Code No: 136CH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, July/August - 2021

LINEAR AND DIGITAL IC APPLICATIONS

(Electrical and Electronics Engineering)

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

Answer any five questions
All questions carry equal marks

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1.a) What is frequency compensation and why is it required in operational amplifier?
b) Draw the circuit diagram of differentiator using op-amp and explain its operation with relevant wave forms. [7+8]

2.a) With the help of circuit diagram, derive the expression for differential voltage gain for a differential amplifier.
b) Design an Inverting operation amplifier which has the closed loop voltage gain of $A_f = -80$. The input voltage is $V_s = 200mV$ with a source resistance of $R_s = 500\Omega$. Find the value of output voltage V_0. The DC supply voltages are $V_{CC} = V_{EE} = 12V$. [9+6]

3.a) Design a first order High pass filter with cutoff frequency of 1KHz and pass band gain of 11. Also draw its frequency response.
b) Explain the Frequency demodulation using 565 PLL. [9+6]

4.a) With the help of a circuit diagram, explain the functioning of triangular wave generator.
b) Explain the working of monostable multivibrator using IC555 with circuit diagram. [7+8]

5.a) With a neat block diagram, explain the data conversion procedure for dual slope ADC.
b) An 8 bit D/A converter as a resolution of 8mV/bit. Find the analog output voltage for the input of 10111010. [8+7]

6.a) Draw the circuit of weighted resistor DAC and derive expression for output-analog voltage.
b) How many levels are possible in a two bit DAC? What is its resolution if the output range is 0 to 3V? [8+7]

7.a) Explain the concept of MOS and CMOS open drain and tri-state outputs.
b) What is a decoder? Explain 3 to 8 line decoder with its truth table. [7+8]

8.a) Draw the basic cell structure of Dynamic RAM. What is the necessity of refresh cycle? Explain the timing requirements of refresh operation.
b) Draw and explain 4 bit Johnson counter. [7+8]

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