Total No. of Questions – [08] Total No. of Printed Pages: [02]

G.R. No.	

paper code : U 229 – 134 (BE – F & Fs)

DECEMBER 2019/ENDSEM Backlog Exam

S. Y. B. TECH. (E & TC) (SEMESTER - II)

COURSE NAME: Integrated Circuits (IC)

COURSE CODE: ETUA22174

(PATTERN 2017)

Time: [**2 Hours**] [Max. Marks: **50**]

(*) Instructions to candidates:

1) **Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data wherever required**

Q1 **a)** Describe with neat block diagram, how operational amplifier works **[6]**

OR

b) Define following parameters of operational amplifier along with their expressions. Also mention their ideal values. **[6]**
a) Input bias current
b) Differential Voltage gain
c) Bandwidth

Q2 **a)** What is Instrumentation amplifier? Describe with reference to 3 opamp circuit. What are the requirements of good instrumentation amplifier(any three). **[6]**

OR

b) Which circuit will you use for converting square wave to triangular wave? Describe how the circuit works. **[6]**

Q3 **a)** With neat circuit diagram and waveforms, describe how Half wave Precision rectifier works. **[6]**

OR

b) In inverting comparator, sine wave input of 4Vpp is given to the inverting terminal and noninverting terminal is grounded. Draw and justify the input –output waveforms. **[6]**

Q4 **a)** What is Butterworth filter? Draw circuit diagram of second order Butterworth Low pass filter. **[4]**

OR

b) Determine the cut off frequency of first order Butterworth high pass filter if R = 1 k ohm and C = 0.1 micro farad. What will be the roll off rate after cutoff frequency? **[4]**

Q5 **a)** Draw the circuit diagram of any voltage to frequency convertor. Describe how the circuit works. **[6]**

b) Draw the transfer characteristics of 4-bit ADC. Give its resolution. **[4]**

c) What is sensitivity of V to I convertor. How much is the sensitivity of V to I convertor with 1mA current and 2V input. **[4]**

OR

Q6 **a)** Draw the circuit of 3 bit Flash ADC and describe its operation. **[6]**

b) Draw the circuit diagram of floating load V to I converter and describe its operation. **[4]**

c) Define resolution of D to A converter? Determine the resolution for 3 bit DAC which has reference voltage 5V. **[4]**

Q7 **a)** Justify that, the X-OR gate can be used as phase comparator. **[6]**

b) Define free running frequency and capture range in PLL. **[4]**

c) Describe how PLL is used as AM detector/demodulator. **[4]**

OR

Q8 **a)** Draw the transfer characteristics of PLL and describe its working with its different modes of operation. **[6]**

b) Describe how PLL is used as FM demodulator? **[4]**

c) An output square wave having frequency 10 times the input square wave is to be obtained using PLL. Draw the block diagram and justify. **[4]**