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Total No. of Pages : 03

Total No. of Questions : 18

### B.Tech. (ECE) (Sem.-5) LINEAR INTEGRATED CIRCUITS Subject Code : UC-BTEC-503-18 M.Code : 78759

Time : 3 Hrs.

Max. Marks : 60

# INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

### **SECTION-A**

### Write briefly :

- 1) Define virtual ground in OpAmp circuits.
- 2) List features of ideal OpAmp.
- 3) Define CMRR for OpAmp. What is typical CMRR value?
- 4) How does negative feedback effect input impedance in non-inverting amplifier?
- 5) What is the significance of slew rate in OpAmp circuits?
- 6) How does zero-detector circuit work?
- 7) What is PLL? Give an application.
- 8) Differentiate monostable, bistable, and astable multivibrators.
- 9) What are instrumentation amplifiers? List some important required features.
- 10) Where do we use positive feedback in OpAmp circuits? Give reasons.

## **SECTION-B**

- 11) Draw labelled internal circuit diagram of OpAmp IC741.
- 12) Draw and explain working of OpAmp based square wave generator.

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13) Determine operating points current and voltage for the differential amplifier circuit shown in the figure. Give parameters are :

$$R_{s1} = R_{s2} = 40\Omega$$
$$R_E = 5k\Omega$$
$$R_{C1} = R_{c2} = 3k\Omega$$
$$\beta = 100$$

Both BJTs are biased using  $\pm 10V$  voltage



- 14) How Schmitt trigger circuit behaves as memory cell. Justify with suitable circuit and waveforms.
- 15) What is PLL? Explain its working principle with help of block diagram.

#### **SECTION-C**

- 16) Draw circuit diagrams to explain working of
  - a) Wein bridge amplifier
  - b) Saw-tooth waveform generator

(S2)-606



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- 17) Derive resultant expressions for followings with the help of suitable circuits.
  - a) R-2R D-to-A converter
  - b) Summing, scaling & averaging amplifier
- 18) Derive expressions for the following in reference to differential amplifier circuit shown in the figure :
  - a) Input impedance
  - b) Output impedance

Given parameters are :

$$R_{s1}=R_{s2}=40\Omega$$

$$R_E = 5 \mathrm{k} \Omega$$

 $R_{Cl} = R_{c2} = 3 \mathrm{k} \Omega$ 

$$\beta = 100$$



NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

**3** M - 7 8 7 5 9

(S2)-606