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**BTECH**  
**(SEM III) THEORY EXAMINATION 2023-24**  
**ANALOG ELECTRONICS**

TIME: 3HRS

M.MARKS: 100

**Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

1. Attempt *all* questions in brief.

2 x 10 = 20

Qno.	Question	Marks	CO
a.	Define bias stability in amplifier circuits.	2	1
b.	What is the purpose of small-signal analysis?	2	1
c.	What are high-frequency transistor models used for?	2	2
d.	What is phase margin?	2	2
e.	Define oscillators.	2	3
f.	Name two types of LC oscillators.	2	3
g.	What is the minimum sustainable voltage in a current mirror?	2	4
h.	What is CMRR?	2	4
i.	Define a precision rectifier.	2	5
j.	What are the functions of an integrator and differentiator?	2	5

**SECTION B**

2. Attempt any *three* of the following:

10 x 3 = 30

a.	Discuss different biasing schemes for BJT and FET amplifiers and their significance.	10	1
b.	Explain the concepts of stability, gain margin, and phase margin.	10	2
c.	Explain the operation of non-sinusoidal oscillators.	10	3
d.	Describe the operation giving circuit of BJT differential amplifier. Obtain expression for input differential resistance and differential voltage gain.	10	4
e.	Define the following with reference to filter : (i) Pass Band (ii) Stop Band (iii) Roll-off rate (iv) Cut-off frequency	10	5

**SECTION C**

3. Attempt any *one* part of the following:

10 x 1 = 10

a.	Explain the Trans-Conductance amplifier with working and circuit diagram along with applications	10	1
b.	Define stability factor. What is meant by transistor-biasing?	10	1

4. Attempt any *one* part of the following:

10 x 1 = 10

a.	Explain the operation of a cascode amplifier and its advantages.	10	2
b.	Discuss different feedback topologies, their effects on gain, bandwidth, and stability, and calculate with practical circuits.	10	2



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Subject Code: KOE037

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5. Attempt any *one* part of the following: 10 x 1 = 10

a.	Review the basic concept of oscillators and the Barkhausen criterion.	10	3
b.	Explain the working of RC phase shift oscillators	10	3

6. Attempt any *one* part of the following: 10 x 1 = 10

a.	Explain the basic topology of a current mirror and its variants.	10	4
b.	What are the desirable characteristics of current mirror circuits? Draw the simple BJT current mirror	10	4

7. Attempt any *one* part of the following: 10 x 1 = 10

a.	Design a second order High Pass Filter to provide a Cut-off frequency of 1 kHz and Pass band gain of 2	10	5
b.	Explain Schmitt trigger and give its applications	10	5

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