PAPER ID-310906

Roll No: | | | | | | | | | | | | | |

B TECH
(SEM-III) THEORY EXAMINATION 2020-21
ANALOG ELECTRONICS CIRCUITS

Time: 3 Hours ***Total 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

Q no.	Question	Marks	CO
a.	What is a multistage amplifier?	2	1
b.	Explain bias stability.	2	1
c.	What are the factors affecting stability of operating point of a transistor?	2	2
d.	Define phase margin.	2	2
e.	What are the advantages of crystal oscillators?	2	3
f.	Compare RC and LC oscillators.	2	3
g.	What is ICMR in op-amp?	2	4
h.	Give few applications of current mirror.	2	4
i.	List any five ideal characteristics of op-amp.	2	5
j.	List the applications of op-amp	2	5

SECTION B

2. Attempt any *three* of the following: 3 x 10 = 30

Q no.	Question	Marks	CO
a.	With the help of a neat diagram, explain the small signal model of FET.	10	1
b.	An amplifier having an input resistance 4kΩ has a voltage gain of 200. If a series negative feedback with β=0.01 is introduced, determine the value of input resistance of the feedback amplifier. If the amplifier in its open loop configuration had cut off frequencies f_1= 2kHz and f_2= 500kHz before the feedback path was added, what is the new bandwidth of the circuit?	10	2
c.	Draw the circuit diagram of Colpitt's Oscillator and explain its principle of operation.	10	3
d.	Discuss basic structure and principle of operation of differential amplifier.	10	4
e.	Why is op-amp not used in open loop for most of the applications? Deduce the expression for closed loop voltage gain of non-inverting amplifier.	10	5

SECTION C

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

a.	Draw the circuit of a BJT in potential divider bias configuration. Derive the expression for Q point voltage and current.	10	1
b.	Draw the block diagram of multistage amplifier. In a multistage amplifier, what is the coupling method required to amplify dc signals?	10	1

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

a.	What is the concept of negative feedback and draw the schematic diagrams of four basic negative feedback configurations?	10	2
b.	What is class A operation and derive the expression for conversion efficiency of a transformer coupled class A power amplifier.	10	2

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

a.	Draw the circuit diagram of wein bridge Oscillator and explain its principle of operation.	10	3
b.	Explain the Barkhausen criteria for oscillations. A Wien bridge oscillator has the following components $R_1 = R_2 = R_4 = 5.6$ kΩ, $R_3 = 12$ kΩ and $C_1 = C_2 = 2000$pF. Calculate the oscillating frequency.	10	3

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

a.	Write short notes on: i) CMRR ii) slew rate iii) common mode gain iv) Differential mode gain.	10	4
b.	What is current mirror circuit? Why is it used in differential amplifier?	10	4

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

a.	Design a three-input summing amplifier using op-amp having gains of 2, 3 and 5 respectively for each input.	10	5
b.	Explain the operation of Op-Amp integrator. Also give its applications.	10	5