Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations February-2022
ANALOG CIRCUITS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	Why h-parameter model is not suitable for high frequencies?	2M
	b	What is positive feedback and negative feedback?	2M
	c	Classify different types of power amplifiers.	2M
	d	What is operational amplifier?	2M
	e	Classify active filters.	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Derive the expression for Hybrid- π capacitance of CE transistor at high frequency.	5M
	b	Derive the expression for the hybrid- π parameters rbb' and gce	5M

OR

3	a	Describe the variation of hybrid- π parameters upon collector current, VCE and Temperature.	5M
	b	If Ic = 1mA and VCE=10V, a certain transistor data shows Cc = Cb'c = 3pF, hfe = 200 and wT = -500 M rad/sec. Calculate gm, rb'e, Ce = Cb'e and wβ	5M

UNIT-II

4	a	Explain the concept of negative feedback with the help of a neat block diagram.	5M
	b	Discuss voltage amplifier and current amplifier with neat diagram.	5M

OR

5	a	Derive the expressions of input and output resistances for Voltage Series FBA.	5M
	b	A voltage series negative feedback amplifier has a voltage gain without feedback of A = 500,input resistance Ri = 3kΩ, output resistance R0 = 20kΩ and feedback ratio β = 0.01. Calculate the voltage gain Af, input resistance Rif, and output resistance Rof of the amplifier with feedback.	5M

UNIT-III

6	a	Discuss on crossover distortion in class B power amplifier.	5M
	b	Describe the operation of a single tuned capacitive coupled amplifier with diagram and derive the expression for its central frequency and Quality factor.	5M

OR

7	a	Discuss Double Tuned Amplifier with neat diagram.	6M
	b	Derive the expression for Double Tuned Amplifier bandwidth.	4M

UNIT-IV

8	Draw an inverting amplifier using an op amp and derive the expression for its closed loop voltage gain.	10M

OR

9	a	Draw the circuit diagram of a Differential Amplifier and derive the expression for its output voltage. Write about difference and common mode gains.	5M
	b	Explain the block diagram of an internal circuit of an operational amplifier.	5M

UNIT-V

10 a Draw a general Sallen-Key Filter and determine its transfer function and from general Sallen Key Filter obtain the transfer function of second order active low pass filter. **5M**

   b Classify Band pass filter. Mention the important parameters of a band pass filter. Draw Second order narrow band pass filter . **5M**

OR

11 a Design a high pass filter with cutoff frequency of 1 KHz and a pass band gain of 2. **5M**

   b What is a notch filter? How do we get a notch filter from a band pass filter? Draw the circuit schematic of a second order notch filter and obtain its transfer function. **5M**

END