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KAMALA INSTITUTE OF TECHNOLOGY & SCIENCE, SINGAPUR
23EC28PC302

II.B. Tech. I. Semester Supplementary Examinations, June-2025

ANALOG CIRCUITS

(ECE)

Time: 3 Hours

Max. Marks: 60

Note: Question paper consists of Part-A & Part-B.

i) **Part-A** for 10M, ii) **Part-B** for 50marks

- Part A** is compulsory, consists of 10 sub questions from all units carrying equal marks.
- Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A		(10Marks)	
Q. No	Questions	Marks	BTL
1.a)	Write a need for Transistor Biasing	1	2
1.b)	Write typical values of h-parameters in CE configuration	1	2
1.c)	Compare performance of FET amplifiers with BJT amplifiers (any two)	1	2
1.d)	Draw CMOS inverter circuit	1	1
1.e)	Classify the amplifiers	1	1
1.f)	What are the types of distortion in amplifiers?	1	2
1.g)	Classify the various negative feedback amplifiers	1	2
1.h)	Write the advantages of negative feedback amplifiers	1	2
1.i)	What are the conditions for oscillation?	1	1
1.j)	Draw the circuit diagram of colpitts oscillator using Transistor	1	1
PART-B		(50Marks)	
Q.No.	Questions	Marks	BTL
2.	Derive the short circuit current gain CE amplifier at high frequencies	10M	3
OR			
3. a)	Explain the concept of operating point with help of dc and ac load lines.	5M	2
b)	Explain the effect of coupling and bypass capacitors on the frequency response	5M	2
4.	Draw a CS MOSFET amplifier, with the help of small signal equivalent circuit, compute its voltage and current gain	10M	3
OR			
5. a)	Draw the CS stage with diode connected load and deduce the expression for voltage gain of the amplifier	5M	3
b)	Briefly explain a Cascode amplifier	5M	2
6. a)	Discuss about Darlington pair	5M	3
b)	Explain the different coupling schemes used in amplifiers	5M	2
OR			

7. a)	When 2-stages of identical amplifiers are cascaded, obtain the expressions for overall voltage gain, current gain and power gain	5M	3
b)	Draw the hybrid- π equivalent of a CE transistor for high frequency & explain the significance of each parameter	5M	3
8. a)	Show that for a current series feedback amplifier the input and output resistances are increased by a factor of $(1+A\beta)$ with feedback.	5M	3
b)	Derive the expressions of input and output resistances for Voltage Shunt FBA	5M	3
OR			
9. a)	Discuss the effect of negative feedback on gain, frequency response and distortion	5M	2
b)	A voltage series negative feedback amplifier has a voltage gain without feedback of $A = 500$, input resistance $R_i = 3k\Omega$, output resistance $R_o = 20k\Omega$ and feedback ratio $\beta = 0.01$. Calculate the voltage gain A_f , input resistance R_{if} , and output resistance R_{of} of the amplifier with feedback	5M	3
10.a)	Draw the equivalent circuit of a crystal and Explain Crystal oscillator with neat diagram	5M	2
b)	Describe the working principle of Wein bridge oscillator and derive the expression for frequency of oscillations	5M	3
OR			
11.a)	Derive an expression for frequency of oscillations of a RC phase shift oscillator	7M	3
b)	In a Hartley oscillator, if $L_1=0.2mH$, $L_2=0.3mH$ and $C=0.003\mu F$, calculate the frequency of its oscillation	3M	2

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