

[M19CS1104]  
**I M. Tech I Semester (R19) Regular Examinations**  
**RF CIRCUIT DESIGN**  
**ELECTRONICS AND COMMUNICATION ENGINEERING**  
**MODEL QUESTION PAPER**

**TIME: 3Hrs.**

**Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

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			CO	KL	M
		<b>UNIT-I</b>			
1.	a).	Explain why skin effects are considered important for RF circuit design.	1	1	8
	b).	Describe briefly how passive components are realized on printed circuit boards at RF.	1	2	7
		<b>OR</b>			
2.	a).	Discuss Inductors and Capacitors - Voltage and Current in RF circuits	1	2	8
	b).	Write short note on Tuned RF / IF Transformers.	1	2	7
		<b>UNIT-II</b>			
3.	a).	Compare the characteristics of coaxial line, two-wire line and a parallel plate transmission line.	2	2	8
	b).	An input impedance of $25 \Omega$ of $\lambda / 4$ transformer is to be matched to a $50 \Omega$ micro strip transmission line at 500 MHz compute the length, width and characteristic impedance of the quarter-wave parallel plate transmission line. The thickness and relative dielectric constant of the substrate material are given as 1 mm and 4.0 respectively. Make assumptions if necessary.	2	1	7
		<b>OR</b>			
4.	a).	Define the following terms for a transmission line. i) Standing wave ratio ii) Return loss iii) Power in dBm iv) characteristic impedance.	2	2	8
	b).	Derive the expression for characteristic impedance of a short circuited transmission line.	2	2	7
		<b>UNIT-III</b>			
5.	a).	Describe how a tunable RF active filter can be realized.	3	3	8
	b).	With the help of neat diagrams describe the structure and functioning of a HEMT.	3	4	7
		<b>OR</b>			
6.	a).	Write a short note on low noise, linear RF BJT operation based on its structure?	3	3	8
	b).	Enumerate the importance of 'power relations' in the design of an amplifier at high frequencies.	3	2	7
		<b>UNIT-IV</b>			
7.	a).	Explain how stable performance can be assured for an RF transistor amplifier using corresponding stability circles.	4	1	8
	b).	Draw a neat circuit diagrams to explain how gain-bandwidth product limitation can be overcome in an RF broadband amplifier design.	4	3	7
		<b>OR</b>			
8.	a).	Discuss MMIC amplifiers,	4	3	8

	<b>b).</b>	Explain Low noise amplifiers	<b>4</b>	<b>4</b>	<b>7</b>
		<b>UNIT-V</b>			
<b>9.</b>	<b>a).</b>	With the help of neat schematics explain how oscillators shld be configured to obtain high frequencies of oscillation. State the principle of operation. State the principle of operation of a dielectric resonator oscillator.	<b>5</b>	<b>5</b>	<b>8</b>
	<b>b).</b>	Low phase noise oscillator design	<b>5</b>	<b>5</b>	<b>7</b>
		<b>OR</b>			
<b>10.</b>	<b>a).</b>	Image Reject and Harmonic mixers, Frequency domain considerations.	<b>5</b>	<b>5</b>	<b>8</b>
	<b>b).</b>	Discuss abt VCOs and Crystal Oscillators	<b>5</b>	<b>5</b>	<b>7</b>

**CO-CRSE TCOME**
**KL**
**-KNOWLEDGE LEVEL**
**M-MARKS**

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