M.E. / M.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Second Semester

M.E - Communication Systems

20PCOPC202 - MIC AND RF SYSTEM DESIGN

Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO
1.	Relate Direct up conversion and 2 step conversion.	2	K1	CO1
2.	Show the formula to calculate sensitivity.	2	K1	CO1
3.	Illustrate Q point and load line concepts.	2	K2	CO2
4.	Define transducer gain of an amplifier.	2	K1	CO2
5.	Contrast linear and non-linear mixer	2	K2	CO4
6.	List out the basic characteristics of mixer.	2	K1	CO4
7.	Summarize the steps in finding root locus	2	K2	CO5
8.	Define ACPR Metric.	2	K1	CO5
9.	What are the effects of nonlinearity in power amplifier?	2	K1	CO6
10.	Classify power amplifier along with its performance parameters.	2	K2	CO6

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

			Marks	K-Level	CO
11.	a)	Describe the Thermal, Shot, Flicker, Popcorn noise and its effects on MOSFET.	13	K2	CO1

OR

			Marks	K-Level	CO
	b) i)	Illustrate Transceiver Specification distributed over a link.	5	K2	CO1
	ii)	Explain in detail about the direct up conversion and two step up conversion process.	8	K2	CO1

			Marks	K-Level	CO
12.	a) i)	Name any three properties of S parameters and prove it.	5	K1	CO2
	ii)	Illustrate the significance of impedance matching in RF ICs with anexample.	8	K2	CO2

OR

			Marks	K-Level	CO
	b)	Interpret Single ended and Differential LNAs and compare its Performance metrics.	13	K2	CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **12682**

13. a) Explain the microwave components directional couplers, hybrid couplers and detectors.   *13 K2 CO4*

<div align="center">OR</div>

  b) i) How frequency multiplication and synthesis can be done by modifying the PLL?   *5 K1 CO4*

     ii) Explain the various resonator configurations with neat diagrams.   *8 K2 CO4*

14. a) Explain in detail the types of efficiency boosting techniques in detail.   *13 K2 CO5*

<div align="center">OR</div>

  b) Identify and explain the following statements:-

    i) Negative feedback amplifier extends bandwidth.   *7 K3 CO5*

    ii) Negative feedback reduces noise.   *6 K3 CO5*

15. a) Illustrate the principles of class E and F amplifiers with neat diagrams.   *13 K2 CO6*

<div align="center">OR</div>

  b) Derive efficiency of a class B power amplifier and explain.   *13 K2 CO6*

<div align="center">PART - C (1 × 15 = 15 Marks)</div>

16. a) Explain Micro strip components and coplanar circuits in detail.   *15 K2 CO3*

<div align="center">OR</div>

  b) Explain in detail the selection of substrate material for MIC component fabrications.   *15 K2 CO3*