Code: 19A452T

III B.Tech. I Semester Supplementary Examinations June 2024
Antenna & Wave Propagation
(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
****

			Marks	CO	BL

UNIT–I

			Marks	CO	BL
1.	a)	State and Prove the reciprocity theorem as applicable to antennas	10M	CO1	L1
	b)	List out the applications of the Reciprocity theorem.	4M	CO1	L1

OR

2.		Derive an expression for the electric field and magnetic field components due to alternating current element.	14M	CO1	L2

UNIT–II

3.	a)	What is Yagi-uda Antenna? Explain the construction and operation of Yagi-uda antenna. Also explain its general characteristics.	10M	CO2	L1
	b)	State the pattern multiplication with necessary equation.	4M	CO2	L1

OR

4.		Derive an expression for the radiation pattern of a Broadside uniform linear array of 4-elements with $\lambda/2$ spacing and draw its radiation pattern.	14M	CO2	L2

UNIT–III

5.	a)	What is reflector? What are the types of reflectors? Explain the features of paraboloidal reflector.	7M	CO3	L1
	b)	Give the details about flat sheet & corner reflectors.	7M	CO3	L1

OR

6.	a)	Discuss about the helical antenna geometry, normal and axial mode of radiation and its applications.	10M	CO3	L2
	b)	Calculate the power gain of an optimum horn antenna approximately with a square aperture of 10λ on a side.	4M	CO3	L3

UNIT–IV

7.	a)	Classify and define the EM waves.	8M	CO4	L2
	b)	Explain the different modes of wave propagation	6M	CO4	L2

OR

8.	a)	Describe the phenomenon of ground wave propagation.	6M	CO4	L2
	b)	Calculate the distance beyond which the earth's curvature to be accounted at frequency of a) 100KHz b) 1MHz c) 10MHz	8M	CO4	L3

UNIT–V

9.	a)	Discuss the effects of earth's curvature.	6M	CO4	L2
	b)	Give the details of Scattering Phenomena in space wave propagation.	8M	CO4	L1

OR

10.	a)	Derive the relation between Maximum usable frequency (MUF) and skip distance for Flat Earth.	7M	CO4	L2
	b)	Write short notes on: Impact of Solar activity in Ionosphere.	7M	CO4	L1

***

III B.Tech. I Semester Supplementary Examinations June 2024

Digital Signal Processing

(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	BL

UNIT–I

1. A discrete time system is represented by the following equation $y(n) = (3/2)$ $y(n-1) - (\frac{1}{2}) y(n-2) + x(n)$ with initial conditions $y(-1) = 0$, $y(-2) = -2$ and $x(n) = (1/4)n\ u(n)$. Determine the total response of the system. | 14M | CO1 | L5

OR

2. a) Write the condition for system stability. | 7M | CO1 | L2

   b) Check and explain whether the system $y(n) = e^{x(n)}$ is linear or not? | 7M | CO1 | L2

UNIT–II

3. How many multiplications and additions are required to compute N point DFT using radix-2 FFT algorithm? | 14M | CO1 | L1

OR

4. Develop the necessary three stage computation equations for radix-2 DIT FFT method. | 14M | CO1 | L6

UNIT–III

5. Convert the analog filter with system function $Ha(s)=[s+0.1]/[(s+0.1)^2+9]$ into a digital IIR filter by means of the impulsive invariance method. | 14M | CO2 | L2

OR

6. a) Compare Butterworth with Chebyshev filters. | 7M | CO2 | L5

   b) Infer the advantages and disadvantages of window. | 7M | CO2 | L4

UNIT–IV

7. Let $x(n)= \{1, 3, 2, 5, -1, -2, 2, 3, 2, 1\}$, find

   (a) Up sample by 2 times and down sample by 4 times

   (b) Down sample by 4 times and up sample by 2 times | 14M | CO3 | L1

OR

8. Given D=100; PB: 0 F 50; TB: 50 F 55; PB ripple:10-2 ; SB ripple:10-4 . Design Two stage Decimator | 14M | CO3 | L6

UNIT–V

9. Write short notes on (a) A/D converters (b) D/A converters | 14M | CO4 | L1

OR

10. Discuss the applications of DSP in musical sound processing. | 14M | CO4 | L1

***

R-19

Code: 19A45BT

III B.Tech. I Semester Supplementary Examinations June 2024
Advanced Digital Design Concepts
(Electronics and Communication Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

		Marks	CO	BL
UNIT–I				
1.	Explain about dynamic electrical behavior of CMOS with neat sketches.	14M	CO1	L2
	OR			
2.	Design a Universal gate using Emitter Coupled Logic.	14M	CO1	L6
UNIT–II				
3.	Explain about various Data Types used in VHDL.	14M	CO2	L2
	OR			
4.	Explain about structural design elements used in VHDL with examples.	14M	CO2	L6
UNIT–III				
5. a)	Design 8x1 Mux using Select statement in VHDL.	7M	CO3	L6
b)	Describe the Syntaxes of Null statement, Loop statements.	7M	CO3	L2
	OR			
6. a)	Differentiate concurrent and sequential signal assignment statements with an example.	7M	CO3	L2
b)	Explain delay models- Inertial delay model, Transport delay model with examples.	7M	CO3	L2
UNIT–IV				
7.	Describe the working of Ones counter using VHDL.	14M	CO4	L2
	OR			
8. a)	Explain about 3x8 decoder with neat sketches.	7M	CO4	L2
b)	Describe the architecture of multiplier with neat sketches.	7M	CO4	L2
UNIT–V				
9.	Explain about Impediments to synchronous design with neat sketches?	14M	CO5	L2
	OR			
10. a)	Design JK flip-flop using D Flip-Flop.	8M	CO5	L6
b)	Describe the T Flip-Flop with its logic diagram.	6M	CO5	L2

***