

Hall Ticket Number :																				
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R-19

Code: 19A453T

III B.Tech. I Semester Supplementary Examinations March/April 2023

Digital Communication

(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

UNIT-I

- 1. a) Write in detail about the drawbacks of Delta modulation 7M
- b) Describe the Bandwidth requirements of PCM 7M

OR

- 2. a) Explain the need of Adaptive Delta modulation with neat sketch 7M
- b) Describe in detail about Differential PCM 7M

UNIT-II

- 3. a) Explain in detail about the Non-Coherent detection of FSK 7M
- b) Describe about the generation of Phase shift Keying with neat diagram 7M

OR

- 4. a) Explain in detail about M-ary signaling 7M
- b) Describe the BASK modulation technique with the help of a neat diagram. 7M

UNIT-III

- 5. a) Define the following i) Information ii) Entropy iii) Rate of Information iv) Channel Capacity 7M
- b) Explain the following terms i) Fixed length coding ii) Variable length coding 7M

OR

- 6. a) Identify the Mutual Information for a Binary Erasure channel 7M
- b) Design a Binary Symmetric channel and find its channel capacity 7M

UNIT-IV

- 7. a) Describe about matrix description of Linear Block Codes 7M
- b) Describe about Error detection and correction capabilities of Linear block codes 7M

OR

- 8. a) Apply Shannon-Fano coding procedure for the message ensemble and find the efficiency of the channel $P=[0.4,0.2,0.12, 0.08, 0.08, 0.08, 0.04]$ 7M
- b) Apply Lempel-Ziv code for a message sequence 1010110110110. 7M

UNIT-V

- 9. a) Explain the Tree Diagram of Convolutional Codes 7M
- b) Describe in detail about Cyclic codes 7M

OR

- 10. a) For a (2,1,3) Convolution encoder if $g_1=[1\ 1\ 0]$ $g_2=[1\ 0\ 1]$ then draw the TREE diagram 7M
- b) Identify the output for a convolutional code of (3,1,3) with $g_1=[1\ 1\ 1]$ $g_2=[1\ 0\ 0]$ $g_3=[1\ 1\ 0]$ for an input message sequence 100110 using Transform domain Approach 7M

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

R-19

Code: 19A453T

III B.Tech. I Semester Supplementary Examinations March/April 2023

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)

UNIT-I

- | | Marks | CO | BL |
|---|-------|-----|----|
| 1. a) If the DFT{x(n)} = X(k)={4, -j2, 0, j2}, using properties of DFT, find DFT of x(n - 2). | 7M | CO1 | L1 |
| b) Find the N-point DFT of a sequence x(n) = {1, 1, 2, 2} | 7M | CO1 | L1 |

OR

- | | | | |
|---|-----|-----|----|
| 2. Examine the properties linearity and time invariance of the given systems. | | | |
| a. $y(n) = x(2n)$ | | | |
| b. $y(n) = x(n)x(n - 1)$ | 14M | CO1 | L4 |

UNIT-II

- | | | | |
|---|----|-----|----|
| 3. a) List the differences and similarities between DIT and DIF algorithms. | 7M | CO1 | L1 |
| b) Calculate the number of multiplications needed in the calculation of DFT and FFT with 64 point sequence. | 7M | CO1 | L3 |

OR

- | | | | |
|--|-----|-----|----|
| 4. Compute the IDFT of the following sequences using DIT algorithm
$X(k) = \{16, 1-j4.4142, 0, 1+j0.4142, 0, 1-j0.4142, 0, 1+j4.4142\}$ | 14M | CO1 | L6 |
|--|-----|-----|----|

UNIT-III

- | | | | |
|---|-----|-----|----|
| 5. Determine the cascade and parallel form realization of the following system
$y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$ | 14M | CO2 | L5 |
|---|-----|-----|----|

OR

- | | | | |
|--|-----|-----|----|
| 6. Summarize the steps in the design of IIR filter using bilinear transformation for any one type of filter? | 14M | CO2 | L5 |
|--|-----|-----|----|

UNIT-IV

- | | | | |
|--|-----|-----|----|
| 7. Explain the applications of Multi Rate Signal Processing. | 14M | CO3 | L2 |
|--|-----|-----|----|

OR

- | | | | |
|--|----|-----|----|
| 8. a) Discuss Decimation by a factor D | 7M | CO3 | L1 |
| b) Explain the concept of Sampling rate conversion by a rational factor I/D. | 7M | CO3 | L2 |

UNIT-V

- | | | | |
|--|-----|-----|----|
| 9. What are the major blocks in Musical sound processing? Explain briefly. | 14M | CO4 | L1 |
|--|-----|-----|----|

OR

- | | | | |
|--|-----|-----|----|
| 10. What are the applications of DSP? Explain any one application clearly. | 14M | CO4 | L1 |
|--|-----|-----|----|

Hall Ticket Number :																			
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

R-19

Code: 19A45BT

III B.Tech. I Semester Supplementary Examinations March/April 2023

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)

UNIT-I

- | | Marks | CO | BL |
|--|-------|-----|----|
| 1. a) Design a CMOS transistor circuit for 2-input NAND gate and explain its operation | 7M | CO1 | L6 |
| b) Differentiate CMOS with TTL logic families. | 7M | CO1 | L2 |

OR

- | | | | |
|--|----|-----|----|
| 2. a) Recall various TTL logic families. | 7M | CO1 | L1 |
| b) Design a CMOS transistor circuit for 2-input XOR gate and explain its operation | 7M | CO1 | L6 |

UNIT-II

- | | | | |
|---|-----|-----|----|
| 3. Summarize about VHDL Design flow with neat sketches. | 14M | CO2 | L2 |
|---|-----|-----|----|

OR

- | | | | |
|---|-----|-----|----|
| 4. Design a Full adder using component declaration in VHDL. | 14M | CO2 | L6 |
|---|-----|-----|----|

UNIT-III

- | | | | |
|---|----|-----|----|
| 5. 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 |

OR

- | | | | |
|---|----|-----|----|
| 6. a) Illustrate a VHDL model for 2 x 4 decoder using Dataflow model. | 7M | CO3 | L4 |
| b) Describe the Syntax of Process Statement. | 7M | CO3 | L2 |

UNIT-IV

- | | | | |
|--|----|-----|----|
| 7. a) Explain about 3x8 decoder with neat sketches. | 7M | CO4 | L6 |
| b) Describe the architecture of multiplier with neat sketches. | 7M | CO4 | L2 |

OR

- | | | | |
|--|----|-----|----|
| 8. a) Design 8X1 Mux using 4x1 Mux. | 7M | CO4 | L6 |
| b) List out the advantages of Combinational Circuits | 7M | CO4 | L1 |

UNIT-V

- | | | | |
|--|-----|-----|----|
| 9. Summarize about Synchronous design methodology? | 14M | CO5 | L2 |
|--|-----|-----|----|

OR

- | | | | |
|---|----|-----|----|
| 10. a) Design T flip-flop using JK Flip-Flop. | 8M | CO5 | L6 |
| b) Determine the Characteristic equations of SR and T-Flip-Flops. | 6M | CO5 | L3 |

Hall Ticket Number :									
----------------------	--	--	--	--	--	--	--	--	--

R-19

Code: 19A452T

III B.Tech. I Semester Supplementary Examinations March/April 2023

Antennas and 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			
1. a) Define an antenna? Give the list of Antenna parameters.	5M	CO1	L1
b) Define the following terms with mathematical expressions: i. Radiation pattern. ii. Radiation Intensity iii. Beam Solid angle	9M	CO1	L1
OR			
2. a) Discuss about the Radiation Mechanism with neat sketches.	6M	CO1	L2
b) Derive the relation between Directivity and effective aperture of an antenna.	8M	CO1	L2
UNIT-II			
3. a) Derive the expression for the far field pattern of an array of 2-isotropic point sources with: i) Equal amplitude and phase ii) Equal amplitude and opposite phase	10M	CO2	L2
b) Give the details about the Parasitic Array.	4M	CO2	L1
OR			
4. a) Derive an Expression of array factor for an n-element uniform array.	10M	CO2	L2
b) List the Hanson-Wood yard conditions for increasing the Directivity.	4M	CO2	L1
UNIT-III			
5. a) A parabolic reflector having the diameter of 2.1m and used at 9GHz. Calculate the gain.	6M	CO3	L1
b) Mention different methods of feeds of parabolic reflector antennas. And explain any two of them.	8M	CO3	L1
OR			
6. a) Draw and explain about the working principle of Helical antenna.	10M	CO3	L4
b) Calculate the directivity (dB) of 20 turns, having $=120$ Circumference equal to wavelength of helical Antenna	4M	CO3	L3
UNIT-IV			
7. a) Discuss the plane earth reflections in ground wave propagation.	10M	CO4	L2
b) Describe the Transition between surface and space wave.	4M	CO4	L2
OR			
8. Discuss curved earth reflections with necessary equations	14M	CO4	L2
UNIT-V			
9. a) Briefly explain the Tropospheric propagation and multi-hop propagation.	10M	CO4	L2
b) Define fading? Explain it.	4M	CO4	L1
OR			
10. a) Discuss about the refraction wave propagation mechanism due to presence and absence of Earth magnetic fields.	10M	CO4	L2
b) Memorize the details about Take-off angle	4M	CO4	L3
