



MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC – ‘A’ Grade

National Ranking by NIRF - Rank band (151-300), MHRD, Govt. of India

B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024

ANTENNAS AND WAVE PROPAGATION

(ELECTRONICS AND COMMUNICATION ENGINEERING)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:**
1. This Part consists of 8 QUESTIONS.
 2. Answer any 5 questions. Each question carries 2 Marks

1	A	Distinguish between isotropic and directional radiators.	2M	BTL1
	B	What is a retarded potential?	2M	BTL1
	C	Why array antennas are preferred over a single radiator?	2M	BTL2
	D	Classify the polarization based on Axial Ratio?	2M	BTL1
	E	Distinguish between resonant and non-resonant radiators.	2M	BTL2
	F	Classify and draw the horn antenna structure?	2M	BTL1
	G	Define MUF?	2M	BTL1
	H	What is the effect of earth's curvature on radio wave propagation?	2M	BTL1

PART – B

(5 x 12 = 60M)

- Note:**
1. This Part consists of 10 QUESTIONS
 2. Answer any 1 question from each Section. Each question carries 12Marks.
 3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Explain the following terms i) Front to Back Ratio ii) Beam Area	6M	BTL2
2.B	A 50cm long vertical dipole operating at 30MHz radiates a maximum electric field of 15mV/m at 5Km distance. Find its power radiated, input current and maximum magnetic field at the same distance.	6M	BTL4

(OR)

3.A	Define the terms Directivity and Power Gain. Show that the Directivity of a short current element is 1.5	6M	BTL2
3.B	Give the far-field expression for a $\lambda/2$ vertical dipole and hence evaluate its radiation resistance	6M	BTL3

SECTION - II

4.A	Explain different modes of helical antenna	6M	BTL2
4.B	Draw with neat sketch explain each element in Yagi-Uda antenna	6M	BTL3

(OR)

5.A	What is folded dipole antenna? Derive the input impedance of folded dipole antenna	6M	BTL2
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5.B	Explain the working Principal of Horn Antenna	6M	BTL2
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SECTION - III

6.A	Design a rectangular microstrip antenna using a substrate with a dielectric constant of 2.2 height $h=0.1588\text{cm}$ so as to resonate at 10GHz	6M	BTL5
6.B	Explain the working principal of parabolic reflector Antenna	6M	BTL2

(OR)

7.A	Give the expression for impedance, bandwidth and directivity of rectangular patch antenna	6M	BTL2
7.B	Derive an expression for aperture field distribution of a paraboloidal reflector.	6M	BTL3

SECTION – IV

8.A	Using the principle of pattern multiplication, estimate and sketch the pattern of a 8element Binomial array by computing its amplitude coefficients.	6M	BTL4
8.B	A standard gain horn antenna with a power gain of 12.5dB, is used to measure the gain of a large directional antenna by comparison method. The test antenna is connected to the receiver and an attenuator adjusted to 23dB in order to have the same receiver output. Find out the gain of the large antenna.	6M	BTL4

(OR)

9.A	For a 4 element Broadside Array with $\lambda/2$ spacing derive the array factor	6M	BTL5
9.B	Explain the need for non-uniform amplitude distribution in a linear array, and hence sketch the pattern of a 4 element Binomial Array	6M	BTL2

SECTION – V

10.A	Define and distinguish between the terms i) Critical Frequency ii) Virtual height iii) skip distance	6M	BTL2
10.B	Compute the free space path loss for a link distance of 30km at a frequency of 10GHz. Also calculate the received power, if the transmitting and receiving antennas have equal gains of 20dB, and the transmitter power is 500W.	6M	BTL5

(OR)

11.A	Sketch and Explain the field strength variation of space waves, with distance and antenna heights, deriving expressions for the same.	6M	BTL5
11.B	Explain in detail about different layers in earth atmosphere	6M	BTL2

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B.TECH III YEAR II SEMESTER REGULAR EXAMINATIONS, APRIL/MAY-2024

DIGITAL SIGNAL PROCESSING

(ECE)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS
2. Answer any 5 questions. Each question carries 2 Marks.

1.	A	Define analog, discrete and digital signals.	2 M	BTL1
	B	What is the necessary and sufficient condition for a stable system?	2 M	BTL1
	C	If DFT of $x(n)$ is $X(k)$, what is the DFT of $x(n-1)$.	2 M	BTL2
	D	How many computations are required for finding 1024 point DFT using FFT?	2 M	BTL2
	E	What do you understand by the Warping effect?	2 M	BTL1
	F	What are the steps required to convert an analog signal to digital signal?	2 M	BTL1
	G	What are FIR filters?	2 M	BTL1
	H	What is the significance of decimator in multirate DSP?	2 M	BTL1

PART – B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.	Define various elementary discrete time signals. Indicate them graphically.	12 M	BTL1
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(OR)

3.	Check whether the following systems are Linear or non-linear and also verify time invariant or time variant. (i) $y(n) = n^2 x(n)$ (ii) $y(n) = 2 x(n) + 4$	12 M	BTL4
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SECTION - II

4.A	State and prove the following properties of DFT. (i) Linearity (ii) Time reversal (iii) Circular time shifting	6 M	BTL2
4.B	Determine the linear convolution of the following sequences using overlap add method $x(n) = \{1, -2, 2, -1, 3, -4, 4, -3\}$, $h(n) = \{1, -1\}$	6 M	BTL3

(OR)

5.	Evaluate the DFT of a sequence, $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ by using the radix 2 DIT-FFT algorithm?	12 M	BTL5
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SECTION - III

6.A	Design analog Butterworth filter that has a – 2 dB passband attenuation at a frequency of 20 rad/sec and atleast – 10 dB stopband attenuation at 30 dB rad/sec.	9 M	BTL5
6.B	Compare Analog and Digital filters.	3 M	BTL4

(OR)

7.A	Design an IIR Butterworth filter for the given specifications: $0.9 \leq H(e^{j\omega}) \leq 1 \quad \text{for } 0 \leq \omega \leq 0.2\pi$ $\leq 0.2 \quad \text{for } 0.4\pi \leq \omega \leq \pi$ Using bilinear transformation. Assume sampling period $T=1$ sec.	9M	BTL5
7.B	Differentiate between Butterworth and Chebyshev filters.	3M	BTL4

SECTION – IV

8.	Explain in detail about Fourier Series Method of design of FIR filters.	12M	BTL4
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(OR)

9	Design an ideal low pass filter with the given frequency response by applying the rectangular window: $H(e^{j\omega}) = \begin{cases} 1 & -\frac{\pi}{2} \leq \omega \leq \frac{\pi}{2} \\ 0 & -\frac{\pi}{2} \leq \omega \leq \pi \end{cases}$ Find the value of $h(n)$ for $N = 11$. Also determine its $H(z)$.	12 M	BTL4
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SECTION – V

10.A	Explain the process of interpolator by a factor L .	6 M	BTL4
10.B	Let $x(n) = \{1, 3, 2, 5, -1, -2, 2, 3, 2, 1\}$, find Up sample by 2 and down sample by 4 times.	6 M	BTL4

(OR)

11.A	Explain coefficient quantization of IIR filters.	6 M	BTL4
11.B	What is Round-off Noise in IIR Digital filters? Discuss its effects in IIR filters.	6 M	BTL4

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B.TECH III YEAR II SEMESTER SUPPLY EXAMINATIONS, APRIL/MAY-2024

DIGITAL SIGNAL PROCESSING

(ECE)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS
2. Answer any 5 questions. Each question carries 2 Marks.

1.	A	Define analog, discrete and digital signals.	2 M	BTL1
	B	What is the necessary and sufficient condition for a stable system?	2 M	BTL1
	C	If DFT of $x(n)$ is $X(k)$, what is the DFT of $x(n-1)$.	2 M	BTL2
	D	How many computations are required for finding 1024 point DFT using FFT?	2 M	BTL2
	E	What do you understand by the Warping effect?	2 M	BTL1
	F	What are the steps required to convert an analog signal to digital signal?	2 M	BTL1
	G	What are FIR filters?	2 M	BTL1
	H	What is the significance of decimator in multirate DSP?	2 M	BTL1

PART – B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
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3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.	Define various elementary discrete time signals. Indicate them graphically.	12 M	BTL1
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(OR)

3.	Check whether the following systems are Linear or non-linear and also verify time invariant or time variant. (i) $y(n) = n^2 x(n)$ (ii) $y(n) = 2 x(n) + 4$	12 M	BTL4
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SECTION - II

4.A	State and prove the following properties of DFT. (i) Linearity (ii) Time reversal (iii) Circular time shifting	6 M	BTL2
4.B	Determine the linear convolution of the following sequences using overlap add method $x(n) = \{1, -2, 2, -1, 3, -4, 4, -3\}$, $h(n) = \{1, -1\}$	6 M	BTL3

(OR)

5.	Evaluate the DFT of a sequence, $x(n) = \{1, 2, 3, 4, 4, 3, 2, 1\}$ by using the radix 2 DIT-FFT algorithm?	12 M	BTL5
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SECTION - III

6.A	Design analog Butterworth filter that has a – 2 dB passband attenuation at a frequency of 20 rad/sec and atleast – 10 dB stopband attenuation at 30 dB dad/sec.	9 M	BTL5
6.B	Compare Analog and Digital filters.	3 M	BTL4

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7.A	Design an IIR Butterworth filter for the given specifications: $0.9 \leq H(e^{j\omega}) \leq 1$ for $0 \leq \omega \leq 0.2\pi$ ≤ 0.2 for $0.4\pi \leq \omega \leq \pi$ Using bilinear transformation. Assume sampling period T=1sec.	9M	BTL5
7.B	Differentiate between Butterworth and Chebyshev filters.	3M	BTL4

SECTION – IV

8.	Explain in detail about Fourier Series Method of design of FIR filters.	12M	BTL4
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(OR)

9	Design an ideal low pass filter with the given frequency response by applying the rectangular window: $H(e^{j\omega}) = \begin{cases} 1 & -\frac{\pi}{2} \leq \omega \leq \frac{\pi}{2} \\ 0 & -\frac{\pi}{2} \leq \omega \leq \pi \end{cases}$ Find the value of h (n) for N = 11. Also determine its H(z).	12 M	BTL4
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SECTION – V

10.A	Explain the process of interpolator by a factor I.	6 M	BTL4
10.B	Let $x(n) = \{1, 3, 2, 5, -1, -2, 2, 3, 2, 1\}$, find Up sample by 2 and down sample by 4 times.	6 M	BTL4

(OR)

11.A	Explain coefficient quantization of IIR filters.	6 M	BTL4
11.B	What is Round-off Noise in IIR Digital filters? Discuss its effects in IIR filters.	6 M	BTL4

CODE: 2000HS04**R20****SET - 2**

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B.TECH III YEAR II SEMESTER REGULAR EXAMINATIONS, APRIL/MAY-2024 MANAGEMENT SCIENCE

(COMMON TO ECE,EEE)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:** 1. This Part consists of 8 QUESTIONS.
2. Answer any 5 questions. Each question carries 2 Marks .

1	A	What is Decentralization?	2M	BTL1
	B	Define Six Sigma	2M	BTL2
	C	Discuss about the Job Production	2M	BTL2
	D	Illustrate the Merit Rating	2M	BTL1
	E	List out the types of HRM Managers	2M	BTL1
	F	Illustrate the Project Management	2M	BTL4
	G	What is Project Cost Analysis?	2M	BTL1
	H	Define Balanced Score Card	2M	BTL2

PART –B

(5 x 12 = 60M)

- Note:** 1. This Part consists of 10 QUESTIONS
2. Answer any 1 question from each Section. Each question carries 12Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	How do functional areas of management differ from management functions? Discuss the major functional areas of management	6M	BTL5
2.B	Critically examine the Herzberg's two -factor theory. Make a comparison between theories of Herzberg and Maslow	6M	BTL3

(OR)

3.A	Explain 14 Principles of Scientific Management Theory.	6M	BTL2
3.B	What do you mean by Leadership style? How can leadership styles be decided based on the use of power and authority	6M	BTL4

SECTION - II

4.A	Explain the types of Plant Layout in manufacturing organizations.	6M	BTL2
4.B	Discuss the Product Life Cycle with suitable example	6M	BTL5

(OR)

5.A	Define Work Study and explain the steps involved in Method study	6M	BTL2
5.B	Explain the ABC Analysis and EOQ	6M	BTL2

SECTION - III

6.A	Compile the Human Resource Management Functions	6M	BTL6
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6.B	Assess the Performance Appraisal Methods in Multinational Company.	6M	BTL5
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(OR)

7.A	Distinguish between Recruitment and Selection.	6M	BTL4
7.B	What do you mean by Job Evaluation and its Pros and Cons	6M	BTL2

SECTION – IV

8.A	Discuss PERT AND CPM in detail manufacturing organization.	6M	BTL4
8.B	Explain the Project Cost Analysis and Merits and Demerits.	6M	BTL6

(OR)

9.A	Discuss the Techniques in PERT		6M	BTL5
9.B	Calculate the critical path for the following projects activities:		6M	BTL4
	Activity	Predecessors	Duration(days)	
	A	Nil	3	
	B	A	4	
	C	A	5	
	D	A	4	
	E	B	2	
	F	D	9	
	G	C, E	6	
	H	F, G	2	

SECTION – V

10.A	Elaborate the Mission, Goals, Policy and Strategy.	6M	BTL4
10.B	Write Steps in Strategy Formulation and Implementation	6M	BTL3

(OR)

11.A	Explain the SWOT Analysis of an Automobile Industry	6M	BTL5
11.B	Distinguish between Bench Marking and Balanced Score Card	6M	BTL4

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CODE: 2000HS04

R20

SET - 2

CODE: 2000HS04

R20

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CODE: 2004PE09**R20****SET - 1**

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B.TECH III YEAR II SEMESTER REGULAR END EXAMINATIONS, APRIL/MAY - 2024

VLSI DESIGN

(ELECTRONICS AND COMMUNICATION ENGINEERING)

[Time: 3 Hours]

[Max. Marks: 70]

PART – A

(5 x 2 = 10M)

- Note:**
1. This Part consists of 8 QUESTIONS.
 2. Answer any 5 questions. Each question carries 2 Marks..

1	A	What is IC? What are different IC layers?	2M	BTL1
	B	Draw the symbol of pMOS and nMOS transistor.	2M	BTL2
	C	Give the steps in ASIC design flow.	2M	BTL2
	D	What is stick diagram?	2M	BTL1
	E	Outline about Dual-rail Domino Logic.	2M	BTL2
	F	List out the components of Data path.	2M	BTL2
	G	Give an example circuit for delay fault CMOS logic circuit.	2M	BTL2
	H	Define Fuse based FPGA	2M	BTL1

PART – B

(5 x 12 = 60M)

- Note:**
1. This Part consists of 10 QUESTIONS
 2. Answer any 1 question from each Section. Each question carries 12Marks.
 3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Enumerate Basic Electrical Properties of MOS	6M	BTL4
2.B	Describe Bi-CMOS Inverters.	6M	BTL3

(OR)

3.A	Discuss on the characteristics and working of the Pass transistors with neat diagram.	6M	BTL3
3.B	Elaborate on characteristics and working of Transmission gate with neat diagram.	6M	BTL4

SECTION - II

4.A	Write about the Simple MOS capacitance model with necessary equations.	6M	BTL3
4.B	Discuss on Detailed MOS gate capacitance and diffusion capacitance model.	6M	BTL3

(OR)

5.A	Give short notes on Transistor scaling.	6M	BTL4
5.B	Explain Interconnect scaling.	6M	BTL2

SECTION - III

6.A	Narrate working of Cascade Voltage Switch Logic (CVSL) with neat diagram	6M	BTL4
6.B	Discuss on Driving large capacitive loads in gate level design.	6M	BTL3

(OR)

7.A	Interpret power dissipation techniques and its impact in CMOS inverter circuits.	6M	BTL4
7.B	Explain the Effects of Fan-in and Fan-out on propagation delay.	6M	BTL2

SECTION – IV

8.A	Write a note on data path subsystem.	6M	BTL2
8.B	Compare SRAM and DRAM.	6M	BTL3

(OR)

9.A	Write short notes on Static CMOS adders.	6M	BTL2
9.B	Elaborate on Serial Access Memories	6M	BTL3

SECTION – V

10.A	Describe Design Approach for PAL	6M	BTL3
10.B	Explain the manufacturing test principle with an example of digital logic circuits	6M	BTL2

(OR)

11.A	Enumerate Design Approach for Standard Cells FPGAs	6M	BTL4
11.B	Interpret Chip level Test Techniques.	6M	BTL3

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