



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

NIRF India Ranking, Accepted by MHRD, Govt. of India

B.TECH III YEAR I SEMESTER REGULAR EXAMINATIONS, DECEMBER-2023
DIGITAL SYSTEM DESIGN
(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	Represent +65 and -65 in sign magnitude, sign 1's complement	2M	BTL2
	B	Express $(26.24)_8$ in decimal	2M	BTL2
	C	Define min term and max term	2M	BTL1
	D	Mention the different clocking types used in FFs	2M	BTL1
	E	Write an excitation table for SR Flip-flop	2M	BTL4
	F	List out the applications of shift register	2M	BTL1
	G	Draw the circuit diagram of parity generator	2M	BTL3
	H	Classify different ICs	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 12 Marks.
 3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Deduce X from the following? (i) $(BA0.C)_{16} = (X)_8$ (ii) $(10101100)_2 = (X)_{16}$ (iii) $(FFE.C)_{16} = (X)_2$ (iv) $(7562)_8 = (X)_2$	6M	BTL2
2.B	Generate the Hamming code word for the message 1110010111	6M	BTL2

(OR)

3.A	Draw the following digital logical gates and truth tables (i) NAND (ii) Exclusive-OR (iii) NOR (iv) Equivalence gate	8M	BTL1
3.B	State and prove De-Morgan's Theorem.	4M	BTL1

SECTION - II

4.A	Simplify the following Boolean functions using K-map method. (i) $f(w,x,y,z) = \sum (0,2,5,6,7,8,10)$ (ii) $f(A,B,C,D) = \pi(1,3,5,7,13,15)$	6M	BTL2
4.B	Simplify the following Boolean function using tabulation method $F(A,B,C,D) = \sum (0,1,2,3,5,7,8,9,11,14)$	6M	BTL2

(OR)

5.A	Design a 4-bit binary to gray code converter	6M	BTL3
5.B	Define Hazard? Explain the types and Hazard free realization	6M	BTL1

SECTION - III

6.A	Define race around condition. Explain how it can be overcome by master slave JK flip-flop with considering its logic diagram	6M	BTL1
6.B	Convert JK Flip-Flop to SR and T Flip-Flops	6M	BTL3

(OR)

7.A	What is a register? Explain about four bit register using four D flip flops.	6M	BTL1
7.B	Design an twisted ring counter and explain its operation	6M	BTL3

SECTION – IV

8.A	Design an asynchronous sequential circuit with two inputs X and Y and with one output Z. Whenever Y is 0, input X is transferred to Z, otherwise, the output remains same	6M	BTL4
8.B	Differentiate between Mealy and Moore machine with examples	6M	BTL2

(OR)

9.A	Design a Mod-12 synchronous counter	6M	BTL4
9.B	Explain about sequence detector	6M	BTL3

SECTION – V

10.A	Realize negative logic AND gate using diodes. Compare the logic families in terms of power dissipation and propagation delay	6M	BTL3
10.B	Draw the circuit diagram and explain DCTL, RTL and DTL	6M	BTL2

(OR)

11.A	With a neat circuit diagram explain the operation of a TTL NAND gate Totem Pole output	6M	BTL4
11.B	Realize NAND and NOR gates using CMOS logic and explain their operation with the help of truth tables.	6M	BTL4

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B.TECH III YEAR I SEMESTER REGULAR EXAMINATIONS, DECEMBER-2023 ELECTROMAGNETIC WAVES (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	Find Cartesian coordinates of B(1.2, -105°, 4).	2M	BTL1
	B	Estimate the spherical coordinates of P(-4, 8, 5).	2M	BTL2
	C	Write Poisson's and Laplace's equations.	2M	BTL1
	D	State Ampere's Force law.	2M	BTL2
	E	Explain the terms Critical Angle and Total Internal Reflection.	2M	BTL1
	F	Distinguish TE and TM modes in rectangular waveguides.	2M	BTL2
	G	Differentiate phase velocity and group velocity in a waveguide.	2M	BTL2
	H	Explain the significance of a Cavity Resonator.	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 12 Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Find the electric potential at (2,0,3) assuming zero potential at infinity due to two point charges -3 μ C and 4 μ C located at (3,-1,4) and (0,5,-2) respectively.	6M	BTL4
2.B	Show the derivation of Electric Field E for a Line charge with a charge density ρ_L C/m.	6M	BTL3

(OR)

3.A	Discuss the derivation of the capacitance of a Parallel plate capacitor.	6M	BTL2
3.B	Find the E- field at a point P(0m, 3m, 8m) due to two uniform line charges of density 6 nC/m located in a plane with y = 0 at x = $\pm$ 3m.	6M	BTL4

SECTION - II

4.A	Summarize the concept of Magnetic Scalar and Vector Potentials with relative equations.	6M	BTL2
4.B	State Biot-Savart's law. Calculate the Magnetic flux density, B due to a finite length filamentary conductor carrying a current of I_0 amperes.	6M	BTL4

(OR)

5.A	Determine the magnetic field intensity, H at the centre of a square loop whose side is "w" carrying a current I amperes.	6M	BTL3
5.B	Develop Magnetic Boundary conditions at the surface of discontinuity	6M	BTL2

	between a conductor and dielectric media.		
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SECTION - III

6.A	Develop the proof that the ratio of E and H for a uniform plane wave is 120π Ohms with necessary equations.	6M	BTL4
6.B	Explain the Reflection of plane waves on the surface of a perfect conductor with normal incidence with necessary equations.	6M	BTL3

(OR)

7.A	Explain the following terms with respect to EM Waves: i) Poynting vector ii) Surface Impedance iii) Brewster angle	6M	BTL2
7.B	Determine the phase velocity of propagation, attenuation constant, intrinsic impedance, phase constant for a forward travelling wave in a large block of copper at 2 MHz. (for Copper: $\sigma = 5.6 \times 10^7 \text{ S/m}$, $\mu_r = \epsilon_r = 1$)	6M	BTL4

SECTION – IV

8.A	Discuss the analysis of TE mode waves in Rectangular waveguides with necessary field equations.	7M	BTL3
8.B	Summarize the concept of Electromagnetic Spectrum and Microwave Bands.	5M	BTL2

(OR)

9.A	Write short notes on Microstrip lines and their applications.	5M	BTL2
9.B	Discuss the analysis of TM mode waves in Rectangular waveguides with necessary field equations.	7M	BTL3

SECTION – V

10.A	Explain the working operation and applications of E plane and H plane Tees and calculate S-matrix for any one.	6M	BTL2
10.B	Discuss the set up of a Microwave bench with different blocks and listout their features.	6M	BTL3

(OR)

11.A	Discuss Volt-Ampere Characteristics of Gunn Diode with neat sketches.	6M	BTL2
11.B	Explain the Mode Characteristics of Reflex Klystron with neat sketches.	6M	BTL3

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B.TECH III YEAR I SEMESTER REGULAR EXAMINATIONS, DECEMBER-2023

JAVA PROGRAMMING (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 data abstraction?	2M	BTL1
	B	Define polymorphism	2M	BTL1
	C	Write the difference between interface and abstract class	2M	BTL1
	D	What is dynamic binding	2M	BTL1
	E	Differentiate between error and exception	2M	BTL1
	F	Write the difference between thread and process	2M	BTL1
	G	List any four methods of file class	2M	BTL1
	H	Write the subclasses of JButton class.	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 12 Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Compare and Contrast procedural and object oriented languages	6M	BTL2
2.B	What are the primitive data types in Java? Write about type conversions	6M	BTL2

(OR)

3.A	What is type casting? Explain its types with proper syntax and example	6M	BTL2
3.B	State and explain scope of variable with an example.	6M	BTL2

SECTION - II

4.A	Explain the different types of inheritances in detail	6M	BTL2
4.B	What is the main function of “final” keyword? Explain the use of final-keyword in a method with an example.	6M	BTL3

(OR)

5.A	How polymorphism can be achieved through methods? Discuss method overloading with a suitable example.	6M	BTL3
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5.B	How do we use design a package? How do we add a class or, an interface to a package?	6M	BTL2
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SECTION - III

6.A	With a suitable Java program explain user-defined exception handling	6M	BTL3
6.B	What are the uses of 'throw' and 'throws' clauses for exception handling? Explain with sample code	6M	BTL3

(OR)

7.A	Write a program that creates a thread that forces preemptive scheduling for lower priority threads.	6M	BTL3
7.B	Describe the complete life cycle of a thread.	6M	BTL2

SECTION – IV

8.A	Explain any two methods of file and file input stream class each	6M	BTL2
8.B	Write a program which stores a list of strings in an Array List and then displays the contents of the list.	6M	BTL3

(OR)

9.A	Explain the file management using File class.	6M	BTL2
9.B	Differentiate between File and File Reader classes along with necessary methods with an example program.	6M	BTL3

SECTION – V

10.A	Design a user interface to collect data from the student for admission application using swing components	6M	BTL4
10.B	What are the various layout managers used in Java? Explain	6M	BTL2

(OR)

11.A	Explain delegation event model in detail	6M	BTL2
11.B	Design an applet which displays rectangle filled with blue colour and Display message as “MRECWEND EXAM” in red colour below it.	6M	BTL3

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B.TECH III YEAR I SEMESTER REGULAR EXAMINATIONS, DECEMBER-2023 MOBILE COMMUNICATIONS (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 cell sectoring	2M	BTL1
	B	What is Grade of Service?	2M	BTL1
	C	What is space diversity?	2M	BTL1
	D	What is meant by Cross talk?	2M	BTL1
	E	List out the types of antennas used at cell site.	2M	BTL2
	F	What are the advantages of cell sectorization over cell splitting?	2M	BTL1
	G	Explain about paging channels	2M	BTL1
	H	Define Handoff	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 12 Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION – I

2.A	Explain the operation of cellular systems.	6M	BTL3
2.B	What is co-channel interference in cellular systems? Explain the different Methods of reducing the co-channel interference.	6M	BTL3

(OR)

3.A	List the various techniques used to expand the capacity of a cellular system. Explain in detail.	6M	BTL2
3.B	Derive the expression for carrier-to-interference ratio in a cellular system For normal case and worst-case scenario with an Omni-directional antenna.	6M	BTL3

SECTION - II

4.A	Explain Antenna parameters and their effects.	6M	BTL3
4.B	What are the various diversity Techniques. Explain Polarization diversity and frequency diversity.	6M	BTL3

(OR)

5.A	What are the different types of non-co-channel interference? Explain	6M	BTL1
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5.B	What are the effects of cell site components? Explain	6M	BTL3
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SECTION - III

6.A	Find the phase difference between direct path and ground reflection paths	6M	BTL3
6.B	Briefly explain the effects due to human made structures.	6M	BTL3

(OR)

7.A	What is meant by propagation and explain types of propagation Techniques.	6M	BTL3
7.B	Explain the construction & Working principal of broadband umbrella pattern antennas in cellular systems	6M	BTL3

SECTION – IV

8.	Explain the following: i) channel barrowing ii) overlaid cells.	12M	BTL3
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(OR)

9.A	Describe the concept of frequency management concern to the numbering the Channels and grouping into the subset	6M	BTL2
9.B	Explain the channel assignment to the mobile units in detail.	6M	BTL3

SECTION – V

10.A	Write short notes on: i) Mobile assisted handoff ii) soft hand off	6M	BTL1
10.B	Explain the following multiple Access techniques. i). TDMA ii). CDMA	6M	BTL1

(OR)

11.A	What are the various methods of delaying the handoff? Explain briefly	6M	BTL1
11.B	What is meant by handoff initiation? Explain the different methods of handoff initiation with suitable diagrams	6M	BTL1

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B.TECH III YEAR I SEMESTER REGULAR EXAMINATIONS, DECEMBER-2023 PROFESSIONAL ENGLISH (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	Define Collocation with an example	2M	BTL1
	B	(i) The Boy said to her, “ Are you going to museum today?” (Change into Reported Speech) (ii) She told me that She was playing Guitar then. (Change into Direct Speech)	2M	BTL3
	C	Differentiate Note making and Note-Taking.	2M	BTL4
	D	Identify various steps in overcoming barriers to listening.	2M	BTL5
	E	Write any Two Stress/Accent Patterns with an example each.	2M	BTL2
	F	Explain the strategies of Reading.	2M	BTL4
	G	Punctuate the sentence: mr johnson has delivered a speech on human psychology	2M	BTL1
	H	Write Any Two types of essays in writing.	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 12 Marks.
3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Enumerate the role of eight Parts of Speech with examples.	6M	BTL1
2.B	There are different ways to enhance one's vocabulary: Explain.	6M	BTL3

(OR)

3.A	What are the various types of Listening Comprehension?	6M	BTL1
3.B	Explain the importance of business vocabulary and communication at workplace in detail.	6M	BTL3

SECTION - II

4.A	Write all the Monophthongs with an example each.	6M	BTL3
4.B	Write all the consonant sounds with an example each.	6M	BTL2

(OR)

5.A	Draw the importance of word accent/stress and intonation while speaking.	6M	BTL4
5.B	Draft a speech on extempore topic, The role of politics in shaping the future of our country.	6M	BTL5

SECTION - III

6.A	Write the dynamics of Group Discussion and its DOs and Don'ts.	6M	BTL2
6.B	List out the benefits of participating in Role Plays as student of engineering	6M	BTL3

(OR)

7.A	'English is not a phonetic language'. Discuss it in the light of 'pronunciation'.	6M	BTL3
7.B	Suggest a few tips for Effective Presentation Skill?	6M	BTL2

SECTION – IV

8.A	Discuss France Bacon's famous quote, 'Reading make tha full man'.	6M	BTL3
8.B	Differentiate critical reading and analytical reading.	6M	BTL2

(OR)

9.A	Explain SQ3R method in reading skills.	6M	BTL1
9.B	Write a note on 'professional etiquette'.	6M	BTL3

SECTION – V

10.A	Differentiate the writing devices, Cohesion and Coherence used in paragraphs.	6M	BTL2
10.B	Draft a Technical Report on the establishment of Computer Peripherals in Hyderabad, Telangana State.	6M	BTL4

(OR)

11.A	Write a paragraph on 'human ethics and values in the 21 st century'.	6M	BTL5
11.B	Apply for a job in any one of the companies of repute by sending your Résumé with a cover letter.	6M	BTL5