

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4101]

IV B. Tech I Semester (R19) Regular Examinations

MICROWAVE ENGINEERING

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1	a.	Explain the operation of a Magic Tee and its applications in detail	1	3	7
	b.	State the principle of operation of Directional coupler. Explain the operation of two hole directional coupler in detail.	1	3	8
OR					
2	a.	An air filled rectangular cavity resonator has $a=d=2\text{cm}$, and $b=1\text{cm}$ and is operated in the TE ₁₀₁ mode calculate I. Resonant frequency. II. If the cavity is filled with a dielectric of a relative permittivity 2.5, what is the resonant frequency?	1	4	7
	b.	State Faraday rotation principle. Explain the operation of the isolator.	1	3	8
UNIT-II					
3	a.	What is a scattering matrix? Write the properties of a scattering matrix	2	3	8
	b.	Derive the S-parameters for Magic Tee.	2	4	7
OR					
4	a.	Show that the 'S' matrix of a perfectly matched 2-port network is $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$	2	3	7
	b.	Explain the operations of directional coupler with the help s-parameters	2	3	8
UNIT-III					
5	a.	Explain the limitations of conventional tubes at Microwave frequencies in detail	3	3	8
	b.	Explain the working of Reflex klystron with neat diagram	3	3	7
OR					
6	a.	Explain the working of Helix travelling wave tube with neat diagram	3	3	8
	b.	Explain the working of Magnetron with neat diagram	3	3	7
UNIT-IV					
7	a.	Explain in detail the principle of operation of GUNN diode and detail different modes of operation of GUNN diode.	4	3	8
	b.	Explain the operation IMPATT diode with suitable diagrams.	4	3	7
OR					
8	a.	Explain the operation TRAPATT diode with suitable diagrams	4	3	8
	b.	Explain the operation TUNNEL diode with suitable diagrams	4	3	7
UNIT-V					

9	a.	Explain the procedure with a neat diagram to measure the coupling factor and directivity of a given directional coupler.	5	3	7
	b.	Explain the procedure for measurement of low and high VSWR with block diagram.	5	3	8
OR					
10		Draw the Block Diagram of Microwave bench setup and explain the each block	5	3	15

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4102]

IV B. Tech I Semester (R19) Regular Examinations

INTERNET OF THINGS

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1	a.	Explain the typical Embedded system architecture with relevant diagram?	1	2	7
	b.	Illustrate an application-specific Embedded system with suitable examples?	1	2	8
OR					
2	a.	Explain about serial communication devices and parallel device ports?.	1	2	7
	b.	Discuss about Real time clock and WATCHDOG TIMER with respect to an Embedded Hardware?	1	2	8
UNIT-II					
3	a.	Draw and explain about Physical Design & Logical Design of IoT	1	2	7
	b.	Define IoT and mention different Characteristics of IoT	1	2	8
OR					
4	a.	Explain in details about IoT protocols	2	3	7
	b.	Differences and Similarities between M2M and IoT.	2	3	8
UNIT-III					
5	a.	With a neat sketch explain basic building blocks of IoT.	2	3	7
	b.	Discuss in detail about i)Ultrasonic Sensor ii) IR Sensor	2	3	8
OR					
6	a.	Explain in details about any two communication technologies.	2	3	8
	b.	Discuss in detail about the following i)LoRaWAN ii)6LoWPAN.	2	3	7
UNIT-IV					
7	a.	Name and explain in detail about any two communication concepts (SPI,I2C)	3	3	7
	b.	Explain How to interface Ultrasonic Sensor with Raspberry PI	3	3	8
OR					
8		Explain the Basic building blocks of an IoT architecture with Raspberry PIdvice.	3	3	15

UNIT-V					
9	a.	Explain in detail about Web Application Messaging Protocol (WAMP).	4	3	8
	b.	Demonstrate the role of Cloud based communication & Data Analytics In IoT	4	3	7
OR					
10		Analyze IoT Design Methodology with a use case.	4	4	15
CO-COURSE OUTCOME		KL-KNOWLEDGE LEVEL	M-MARKS		

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4103]

IV B. Tech I Semester (R19) Regular Examinations

DIGITAL IMAGE PROCESSING

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT.**

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1	a.	Explain the fundamental steps of digital image processing.	1	2	7
	b.	Explain about elements of visual perception.	1	2	8
OR					
2	a.	Explain the basic relationship between pixels.	1	2	7
	b.	With the help of a neat block diagram explain image sensing and acquisition.	1	3	8
UNIT-II					
3	a.	Describe image histogram equalization.	2	3	7
	b.	Examine image smoothing process using frequency domain filters?	2	2	7
OR					
4	a.	Discuss about the Butterworth high pass filtering.	2	2	7
	b.	Explain basic intensity transformations techniques for image enhancement?	2	2	8
UNIT-III					
5	a.	Outline the functioning of general image compression system with a neat sketch.	3	3	7
	b.	Explain about lossless predictive coding.	3	2	8
OR					
6	a.	Illustrate Huffman coding process with an example	3	3	7
	b.	Categorize and illustrate different types of redundancies?	3	2	8
UNIT-IV					
7	a.	Write a short note on Region Growing.	4	3	7
	b.	Explain about the Local processing for edge linking.	4	2	8
OR					
8	a.	Differentiate edge based segmentation and region based segmentation	4	3	7
	b.	Explain about Region Splitting and Merging with an example.	4	2	8
UNIT-V					
9	a.	Explain how to convert RGB to HSI color model?	5	2	7

	b.	Explain about slicing in color image processing.	5	2	8
OR					
10	a.	Compare analog video and Digital video?	5	3	7
	b.	Explain about tone and color correction in color image processing.	5	2	8
		CO-COURSE OUTCOME	KL-KNOWLEDGE LEVEL		M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4104]

IV B. Tech I Semester (R19) Regular Examinations

FIBER OPTIC COMMUNICATIONS

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
		UNIT-I			
1.	a).	Discuss in detail about pulse broadening in Graded index fibers.	1	2	7
	b).	A multimode step index fiber with a core diameter of 80 μm and a relative index difference of 1.5% is operating at a wave of 0.85 μm if the core refractive index 1.48, Calculate (i) the normalized frequency for the fiber (ii) the number of guided modes?	1	3	8
		OR			
2.	a).	Discuss in detail about advantages of optical fiber communications?	1	2	7
	b).	Calculate Numerical Aperture of a silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47?	1	3	8
		UNIT-II			
3.	a).	Explain in detail about optical fiber fabrication and summarize all the steps involved.	2	2	8
	b).	Explain the splicing procedure and compare any two splicing techniques with a neat sketch.	2	3	7
		OR			
4.	a).	Describe the basic structure of the cable and explain all the structural elements.	2	2	8
	b).	List all the connection losses with neat sketches and determine the formulae for losses.	2	3	7
		UNIT-III			
5.	a).	Describe the two basic LED structures that are suitable for optical fibers with neat schematics.	3	2	8
	b).	A double heterojunction IN GaAsP LED emitting at a peak wavelength of 1310nm has radiative and nonradiative recombination times 25ns and 90ns, respectively. The drive current is 35 mA. Calculate the internal quantum efficiency and the internal power level.	3	3	7
		OR			
6.	a).	List and explain all the injection laser characteristics	3	2	8

	b).	Compare and draw a conclusion for two different semiconductor photodiodes with and without internal gain.	3	4	8
UNIT-IV					
7.	a).	Determine the power coupled from LED to fiber for both step index and graded index fibers.	3	3	8
	b).	Discuss about (i)Equilibrium numerical aperture. (ii)Probability of error	3	2	8
OR					
8.	a).	Explain the operation of a fundamental Fiber optic receiver.	4	3	8
	b).	Explain about analog receivers.	4	2	7
UNIT-V					
9.	a).	Design a single mode fiber link by calculating the length of the fiber with an attenuation of 0.3dB/km and with the required power margin 3dB. The fiber link includes 5 splices at 0.02dB/Splice, 4 connectors at 0.2dB/Connector, transmitter power of -10 dBm and the receiver sensitivity of -25 dBm.(Use graphical method)	4	4	7
	b).	Explain point to point links with relevant diagrams.	4	2	8
OR					
10.	a).	A Local data link is to be installed having the following characteristics: Maximum bit rate, 16 M bits/sec: installation length, 2000 m; operating wavelength, 850 nm; rise time of the light wave equipment 4ns, and LED spectral width 20 nm. Test whether Multimode 62.5/1125 μm fiber supports the required bit rate?	4	4	8
	b).	Describe the operation of the WDM system with a neat diagram.	4	3	7

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)**[B19EC4105]****IV B. Tech I Semester (R19) Regular Examinations****ANALOG IC DESIGN****ELECTRONICS & COMMUNICATION ENGINEERING****MODEL QUESTION PAPER****TIME: 3Hrs.****Max. Marks: 75 M****Answer ONE Question from EACH UNIT.**

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1.	a).	Draw the small-signal model for the MOS transistor. Briefly explain each component in that?	1	2	7
	b).	Discuss about the Passive Components of the MOS transistor.	1	2	8
OR					
2.	a).	Discuss in detail about the Large-signal model for the MOS Transistor.	1	2	7
	b).	Discuss in detail about the computer simulation models	1	2	8
UNIT-II					
3.	a).	Explain about the Bipolar simple current mirror with degeneration helper with necessary equations.	2	2	8
	b).	Write short notes on MOS Switch, MOS Diode, MOS Active Resistor	1	2	7
OR					
4.	a).	Write short notes on Current Sinks and Sources	1	2	7
	b).	Explain the difference between cascode current mirror and Wilson current mirror	2	2	8
UNIT-III					
5.	a).	Briefly explain the differential amplifiers with necessary equation give the large signal analysis of CMOS differential amplifiers	3	3	7
	b).	Write short notes on current amplifiers	1	3	8
OR					
6.	a).	Explain about high gain amplifier architectures	2	2	7
	b).	Derive the expression for power-supply rejection ratio of Two-stage op-amps	3	3	8
UNIT-IV					
7.	a).	Explain about the design of CMOS op-amps	3	2	7
	b).	Write short notes on Cascode amplifiers	3	2	8
OR					
8.	a).	Explain the compensation of Op-amps.	3	2	7
	b).	With neat sketch explain the following a) Characteristics of Op-Amp b) Classification of Op-Amp	3	2	8

		UNIT-V			
9.	a).	Explain about the different types of Open loop comparator	4	2	8
	b).	Write short notes on Discrete-Time Comparators.	4	2	7
		OR			
10.	a).	Write short notes on Switched capacitor comparators	4	2	7
	b).	Write Short notes on Regenerative comparators	4	2	8
		CO-COURSE OUTCOME	KL-KNOWLEDGE LEVEL	M-MARKS	

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4106]

IV B. Tech I Semester (R19) Regular Examinations

SPEECH PROCESSING

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1.	a).	Explain human speech production system with the help of a schematic representation of its physiological mechanism.	1	2	7
	b).	Explain briefly about digital modelling of speech signals.	1	2	8
OR					
2.	a).	Write a brief note on nature and classification of sounds.	1	2	8
	b).	Explain the purpose of digital processing of speech signals and its applications,	1	2	7
UNIT-II					
3.	a).	Explain how short time energy, short time average magnitude, short time average zero crossing rate are useful in speech processing?	2	2	8
	b).	Explain about voiced and unvoiced speech signals? Mention its significance in speech processing.	2	2	7
OR					
4.	a).	Explain with neat schematic of signal flow about Speech vs Silence Discrimination using short time energy and Zero crossing.	2	2	8
	b).	What is Pitch of a speech signal? pitch period is estimated using autocorrelation function.	2	2	7
UNIT-III					
5.	a).	What is a spectrogram? What are their types? Explain its significance and applications in speech processing.	3	2	8
	b).	What are the typical values of parameters (e.g. window duration, FFT length, and window shift) for wideband and narrowband spectrograms? Give the reasoning for the same.	3	2	7
OR					

6.	a).	A speech signal is sampled at a rate of 20000 samples/sec (20 kHz). A segment of length 1024 samples is selected and the 1024-Point FFT is computed. (i) What is the frequency resolution (spacing in Hz) between the FFT values? (ii) If the first peak in the spectrum occurs at 15th to sample, what is the pitch frequency? Hence, find out the period of one glottal cycle.	3	3	8
	b).	Write a note on spectrographic analysis of speech signals	3	2	7
UNIT-IV					
7.	a).	Explain basic principles of linear predictive analysis.	4	2	7
	b).	Explain the method to determine pitch period of speech signal using LPC analysis.	4	2	8
OR					
8.	a).	Discuss the Cholesky Decomposition Solution for Covariance Method for LPC Analysis.	4	2	7
	b).	Explain autocorrelation method for format analysis.	4	2	8
UNIT-V					
9.	a).	Explain the homomorphic processing system for convolution, with a block schematic.	5	2	7
	b).	Explain in detail the automatic speech recognition system with suitable examples.	5	2	8
OR					
10.	a).	What is the difference between speaker identification and speaker verification?	5	2	7
	b).	What are the features used for the speaker recognition verification system and how? Give a brief note about the features that distinguish speakers.	5	2	8

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4107]

IV B. Tech I Semester (R19) Regular Examinations

RADAR ENGINEERING

ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer ONE Question from EACH UNIT.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1	a.	Explain the basic working of Radar with a detailed block diagram.	1	2	7
	b.	Explain about integration of Radar Pulses and formulate the integration efficiency.	1	3	8
(OR)					
2	a.	Derive the Radar equation. Discuss the effect of pulse width and pulse repetition frequency on the Radar performance.	1	4	8
	b.	What are the various system losses existed in RADAR system	1	2	7
UNIT-II					
3	a.	Illustrate the different types of duplexers used in Radar system.	2	3	7
	b.	Discuss the different types of mixers used Radar receiver	2	2	8
(OR)					
4	a.	Illustrate the different types of displays used in Radar system.	2	3	8
	b.	What are the functions of Radar receiver and discuss the Noise figure	2	2	7
UNIT-III					
5	a.	Explain the principle of operation of an MTI Radar with a neat block schematic diagram.	3	3	7
	b.	An MTI radar receiver indicated a Doppler shift from an automobile as 1.0 KHz. The radar is operating at a frequency of 10GHz with a PRF OF 1KHz. Find the speed of the automobile.	3	4	8
(OR)					
6	a.	Explain the function of pulse-Doppler radar and how it is different from simple pulse radar?	3	2	7
	b.	What are the three lowest blind frequencies of the radar when it is operating at 10 GHz with a PRF of 1KHz.	3	4	8
UNIT-IV					
7	a.	Draw the block diagram of a amplitude comparison Mono Pulse Tracking Radar system and explain its operation.	4	2	8
	b.	Compare Conical Scan tracking Radar and Sequential tracking Radar	4	2	7
(OR)					
8	a.	Explain the basic working principle of Synthetic Aperture Radar (SAR).	4	2	8

	b.	Illustrate the Active and Passive Aperture Phased array Radars.	4	2	7
UNIT-V					
9	a.	Explain the various techniques that can be used to electronically interfere with Radar performance. What electronic counter measures to be taken to overcome them.	5	2	7
	b.	Explain the working of Instrument Landing System(ILS) used in aircraft Landing.	5	2	8
(OR)					
10	a.	Explain the working Principle of Direction Finder	5	2	8
	b.	Explain the working Principle of Hyperbolic Navigation system	5	2	7
CO-COURSE OUTCOME			KL-KNOWLEDGE LEVEL		M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4201]

IV B. Tech II Semester (R19) Regular Examinations

CELLULAR AND MOBILE COMMUNICATIONS

ELECTRONICS AND COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
		UNIT-I			
1.	a).	Why does the basic geographic unit of the cellular system have a hexagonal shape? Explain.	1	2	7
	b).	Describe the principle of operation of cellular mobile system and Explain Cellular concept with neat diagram.	1	2	8
		OR			
2.	a).	Briefly discuss the different types of wireless communication systems.	1	2	7
	b).	Write about the system design fundamentals of wireless communication Systems	1	2	8
		UNIT-II			
3.	a).	What is meant by hand off? Describe the classification of hand off process.	1	2	7
	b).	If 20 MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 kHz RF bandwidth. Find i.The number of duplex channels ii.The total number of channels per cell size if N=4 reuse is used.	1	3	8
		OR			
4.	a).	Explain about the trunk and grade service in wireless communications.	1	2	7
	b).	Write in detail about the different Methods for improving coverage and Capacity in cellular system	1	2	8
		UNIT-III			
5.	a).	Write a short note on TDMA, FDMA, SDMA, and CSMA.	2	2	8
	b).	Write in detail about packet radio in wireless communications.	2	2	7
		OR			
6.	a).	How the spread spectrum increases the capacity of a wireless channel? Explain.	2	2	7
	b).	Write about the different multiple access techniques.	2	2	8
		UNIT-IV			
7.	a).	What are the different types of GSM channels? Explain.	3	2	7

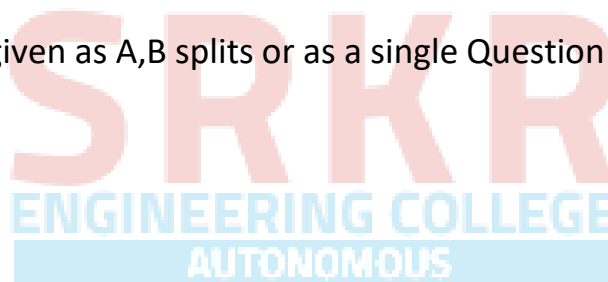
	b).	Explain the frame structure of GSM, in detail.	3	2	8
		OR			
8.	a).	Explain about forward and reverse CDMA channels.	3	2	7
	b).	Write about AMPS and IS-94.	3	2	8
		UNIT-V			
9.	a).	What is large scale path loss? Explain.	4	2	7
	b).	What is fading? How its effect the wireless mobile communication explain.	4	2	8
		OR			
10.	a).	If transmitter power is 1W and carrier frequency is 2.4GHz, and the receiver is at a distance of 1Km from the transmitter. Assume that the transmitter and receiver antenna gains are 1.6. 1.Find the received power in dBm in the free space of a signal. 2.What is the path loss in dB?	4	3	7
	b).	Discuss about different types of indoor and outdoor propagation models.	4	2	8

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks



SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4202]

IV B. Tech II Semester (R19) Regular Examinations

SATELLITE COMMUNICATIONS

ELECTRONICS AND COMMUNICATION ENGINEERING

MODEL QUESTION PAPER

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1.	a).	Express the three Kepler's laws of planetary motion.	1	2	7
	b).	Explain about various orbital parameters used in orbital analysis of a satellite.	1	3	8
OR					
2.	a).	Derive the suitable equations for look angles and the range for geostationary satellites.	1	3	8
	b).	Explain about different launch vehicles.	1	2	7
UNIT-II					
3.	a).	Examine how the attitude and orbit control system (AOCS) is achieved through spin stabilization systems? Give necessary diagrams.	2	3	8
	b).	Explain the reason for intermodulation noise originating in a satellite link.	2	2	7
OR					
4.	a).	Explain TT and C system in detail.	2	2	8
	b).	Explain about various power sources for the satellite.	2	2	7
UNIT-III					
5.	a).	Calculate the carrier-to-noise ratio for the combined uplink and downlink communication.	3	3	8
	b).	State how intermodulation noise originates in a satellite link and describe how it is reduced?	3	3	7
OR					
6.	a).	Explain the effect of rain in both uplink and downlink communication.	3	2	8
	b).	Summarize the sources of noise in satellite communication. What is the importance of noise temperature in link design?	3	2	7
UNIT-IV					
7.	a).	Illustrate the features of various multiple access schemes deployed for satellite access and compare it.	4	3	8
	b).	Determine the limitations of CDMA	4	2	7
OR					
8.	a).	Explain direct sequence spread spectrum communication in detail.	4	2	8
	b).	Compare single access and multiple accesses.	4	3	7

UNIT-V					
9.	a).	State and explain the working principle behind GPS?	1	2	7
	b).	Explain how receiver position in 3D is determined in GPS with neat diagrams.	1	3	8
OR					
10.	a).	Explain the function of different segments in the operation of GPS in detail with necessary diagrams	1	2	7
	b).	Compare GPS, GLONASS and GALILEO in terms of orbit configuration and services.	1	3	8

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

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SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4203]

**IV B. Tech II Semester (R19) Regular Examinations
LOW POWER VLSI DESIGN
ELECTRONICS AND COMMUNICATION ENGINEERING
MODEL QUESTION PAPER**

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1.	a).	What is the need for low power circuit design? Explain the issues involved in low power VLSI Design.	1	2	7
	b).	What are the sources of power dissipation? Explain any 4 sources.	1	2	8
OR					
2.	a).	Discuss about (i) hot electron effect (ii) velocity saturation	1	2	7
	b).	Explain briefly about short channel effects.	1	2	8
UNIT-II					
3.	a).	Discuss about switched capacitance minimization approach	2	2	7
	b).	Describe about VTCMOS circuits.	2	2	8
OR					
4.	a).	Compare pipelining and parallel processing approaches with suitable examples.	2	3	7
	b).	Explain MTCMOS circuits along with advantages and disadvantages.	2	3	8
UNIT-III					
5.	a).	Design a conventional CMOS Full Adder and discuss its performance.	3	3	7
	b).	Describe Low-Voltage Low-Power Design Techniques.	3	3	8
OR					
6.	a).	Design a CMOS Carry Select Adder and discuss its performance.	3	3	7
	b).	Design a CMOS Carry Look A Head Adder and discuss its performance.	3	3	8
UNIT-IV					
7.	a).	What are the building blocks are needed for binary array multiplier	4	2	7
	b).	Construct Baugh-Wooley Multiplier and explain its operation	4	2	8
OR					
8.	a).	Discuss Types of Multiplier Architectures.	4	2	7
	b).	Explain about Wallace Tree Multiplier.	4	2	8
UNIT-V					

9.	a).	In what way the DRAMs differ from SRAMs?	4	2	7
	b).	Explain Precharge and Equalization Circuit in memories.	4	2	8
OR					
10.	a).	Explain the read and write operations for a one-transistor transistor DRAM cell.	4	2	7
	b).	Explain the Future Trend and Development of ROMs.	4	2	8

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

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ENGINEERING COLLEGE
AUTONOMOUS

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

[B19EC4204]

**IV B. Tech II Semester (R19) Regular Examinations
BIO MEDICAL SIGNAL PROCESSING
ELECTRONICS AND COMMUNICATION ENGINEERING
MODEL QUESTION PAPER**

TIME: 3Hrs.

Max. Marks: 75 M

Answer **ONE Question** from **EACH UNIT**.

All questions carry equal marks.

			CO	KL	M
UNIT-I					
1.	a).	Write in detail about spectral estimation in biomedical signals	1	2	8
	b).	Enumerate the origin of bio potentials with example.	1	2	7
OR					
2.	a).	What is meant by Joint probability?	1	2	8
	b).	Write in detail about objectives of biomedical signal analysis	1	2	7
UNIT-II					
3.	a).	Discuss the electric activity of the heart. What is the significance of the Einthoven's triangle?	2	3	8
	b).	Explain the use of computers in analysis of biomedical signals.	2	3	7
OR					
4.	a).	Explain how time frequency analysis is helpful in biomedical signal processing.	2	4	8
	b).	Design an optimal filter to remove noise from a signal, given that the signal and noise processes are independent, stationary, random processes.	2	4	7
UNIT-III					
5.	a).	write in detail about turning point algorithm	3	2	8
	b).	Write in detail about frequency domain analysis of ECG	3	3	7
OR					
6.	a).	After applying the AZTEC algorithm to a signal, the saved data array is {2, 50, -4, 30,-6, 50, -6, 30, -4, 50, 2, 50}. i. Draw the waveform that AZTEC would reconstruct from these data. ii. What is the amount of data reduction? iii. What is the peak-to-peak amplitude of a signal reconstructed from these data?	3	4	15
UNIT-IV					
7.	a).	Comment on ICA. How is it applicable for cocktail party like problem as applied to EEG signals	4	3	8

	b).	Explain the principles of Adaptive noise canceller with an example	4	2	7
		OR			
8.	a).	Given a biomedical signal, identify discrete signal epochs and correlate them with events in the related physiological processes	4	3	8
	b).	Write a note on Joint Time-frequency analysis of biomedical signals	4	3	7
		UNIT-V			
9.	a).	Write down the classification of EEG rhythms based on the frequency bands	5	3	8
	b).	Mention the types of artifacts interfering with the EEG acquisition and the method by which they are processed.	5	3	7
		OR			
10	a).	Propose a method to detect the presence of the α rhythm in an EEG channel. How is it extended to detect the presence of the same rhythm simultaneously in two channels?	5	3	8
	b).	With a suitable algorithm, substantiate the adaptive segmentation of EEG signals.	5	4	7

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 15 marks

