MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade, ISO 9001:2008 Certified)

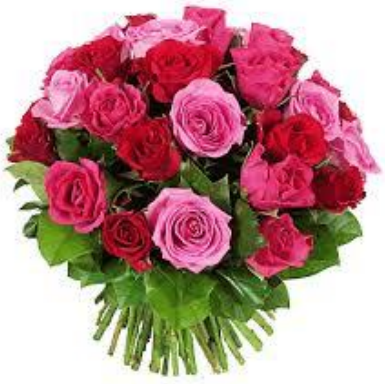
Maisammaguda, Dhulapally, Secunderabad – 500100.

DEPARTMENT OF
ELECTRONICS & COMMUNICATION ENGINEERING

IV B.TECH I SEMESTER QUESTION BANK

(2019 – 20)

INDEX



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Regular Examinations

VLSI Design

(ECE)

Model Paper -I

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART-A (25 Marks)

1). a	Write short notes on Pass transistor	**[2M]**
b	Define Threshold voltage and give the expression of V_t	**[3M]**
c	What are the different MOS layers?	**[2M]**
d	Draw the stick diagram of NMOS inverter	**[3M]**
e	Define Fan-in with diagram	**[2M]**
f	Write about the switch logic and transmission gate concept	**[3M]**
g	What is the standard cell-based ASIC design?	**[2M]**
h	Write short notes on Parity generators	**[3M]**
i	What is the difference between fault and error?	**[2M]**
j	Define Observability and controlability	**[3M]**

PART-B (50 MARKS)

SECTION-I

2	Give the different types of CMOS fabrication process? Explain the nwell process with neat diagrams	**[10M]**

OR

3	Derive the $I_{ds} - V_{ds}$ relationships and figure of merit of a NMOS transistor	**[10M]**

SECTION-II

4	a) Design a stick diagram for the CMOS logic shown y = (AB+CD).	**[5M]**
	b) Discuss about the Scaling of MOS circuits and write any five device parameters scaling factors.	**[5M]**

OR

5	a) Explain Lambda(λ)-based design rules for wires, contacts and Transistors with neat diagrams	**[6M]** **[4M]**
	b)Draw the layout for CMOS inverter	

SECTION-III

6	a) Discuss about the pseudo NMOS logic and Dynamic CMOS logic with suitable examples	**[5M]**
	b) What is meant by sheet resistance Rs? Explain the concept of Rs applied to MOS transistors.	**[5M]**

OR

7	a) Discuss about the methods for driving large capacitive loads	**[6M]**
	b) Explain the concept of domino logic	**[4M]**

SECTION-IV

8	a) Explain the working of serial – parallel multiplier	**[5M]**
	b) Discuss about the full custom design with an example	**[5M]**
	OR	
9	Explain the detailed configurable logic block architecture of FPGA	**[10M]**

SECTION-V

10	a) Illustrate the CMOS testing.	**[5M]**
	b) Explain the chip level testing techniques	**[5M]**
	OR	
11	a) Discuss about the Board Level Test Techniques	**[6M]**
	b) Discuss about the Stuck-at faults	**[4M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Supplementary Examinations

VLSI Design

(ECE)

Model Paper -II

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART-A (25 Marks)

1).	a	Briefly explain the Body bias ?	**[2M]**
	b	What are the different regions of operation of a MOS transistor and briefly explain?	**[3M]**
	c	Draw the layout structure of Depletion mode NMOS transistor	**[2M]**
	d	What is Stick Diagram? What are the uses of Stick diagram?	**[3M]**
	e	Define Fan-out with diagram	**[2M]**
	f	Explain the Sheet resistance concept applied to MOS transistor	**[3M]**
	g	List the subsystems in Datapath.	**[2M]**
	h	Differentiate the differences between Full-custom and Semi-custom design	**[3M]**
	i	List the basic types of CMOS testing.	**[2M]**
	j	Write about stuck-at faults	**[3M]**

PART-B (50 MARKS)

SECTION-I

2		Explain the complete CMOS fabrication process using n-well process with neat diagrams.	**[10M]**
		OR	
3	a)	Explain how the BICOMS inverter performance can be improved	**[5M]**
	b)	Explain various regions of CMOS inverter transfer characteristics.	**[5M]**

SECTION-II

4	a)	Design a stick diagram for NMOS EX-OR gate	**[5M]**
	b)	Discuss about the Limitations of Scaling	**[5M]**
		OR	
5	a)	Describe the VLSI Design Flow in detail with diagram.	**[5M]**
	b)	Draw the layout for the function F= AB+C using CMOS logic.	**[5M]**

SECTION-III

6	a)	Explain the requirement and operation of pass transistor and transmission gates and how the switch logic can be implemented using Pass Transistors	**[6M]**
	b)	Draw and explain the structure of AND and NAND using pseudo nmos logic.	**[4M]**
		OR	
7	a)	What do you mean by inverter delay? Explain how the inverter delays are	**[6M]**

calculated?

b) Calculate the gate capacitance value of 5mm technology minimum size transistor with gate to channel value is $4x10^{-4}$ pF/mm^2. **[4M]**

SECTION-IV

8 a) Explain the detail architecture of FPGA **[6M]**

b) Explain the difference between FPGA and CPLD . **[4M]**

OR

9 a) Explain the structure of Carry select Adder. **[5M]**

b) Discuss about the Parameters influencing Low power Design. **[5M]**

SECTION-V

10 a) Explain the operation of BIST **[5M]**

b) Briefly discuss about the Design strategies for test. **[5M]**

OR

11 a) Explain the need for Testing **[4M]**

b) Discuss about the Scan based testing **[6M]**

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Regular Examinations

VLSI Design

(ECE)

Model Paper -III

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART - A

(25 Marks)

1.a)	Define g_m of MOS transistor.	[2]
b)	Draw transfer characteristics of CMOS inverter.	[3]
c)	Define scaling and explain it.	[2]
d)	Explain difference between stick diagram and layout diagram.	[3]
e)	Define delay and explain different time delays in gate level modeling.	[2]
f)	Explain the importance of wiring capacitance of a MOS transistor.	[3]
g)	Explain the difference between EPROM and EEPROM.	[2]
h)	Draw 2-bit comparator.	[3]
i)	Explain difference between PLA and PAL.	[2]
j)	Define controllability and observability with respect to testing.	[3]

PART - B

(50 Marks)

2. Draw the fabrication steps of CMOS transistor and explain its operation in detail. [10]

OR

3. Draw the fabrication steps of NMOS transistor and explain its operation in detail. [10]

4.a) Draw the flow chart of VLSI Design flow and explain the operation of each step in detail.
b) Draw the stick diagram for three input AND gate. [6+4]

OR

5. What is the purpose of design rule? What is the purpose of stick diagram? What are the different approaches for describing the design rule? Give three approaches for making contacts between poly silicon and discussion in NMOS circuit. [10]

6.a) Draw and explain fan in and fan out characteristics of different CMOS design technologies.
b) Explain different wiring capacitance used in Gate level design with example. [5+5]

OR

7. What are the alternate gate circuits available? Explain any one of item with suitable

sketch by taking NAND gate as an example. [10]

8.a) Draw the basic circuit diagram of static RAM and explain its operation.
b) Draw the basic block diagram of 4-bit adder and explain its operation in detail. [5+5]

OR

9.a) Explain the CMOS system design based on the I/O cells with suitable example.
b) Design a four bit parity generator using only XOR gates and draw the Schematic of it. [5+5]

10.a) Why the chip testing is needed? At what levels testing a chip can occur?
b) What is the drawback of serial scan? How to overcome this? [5+5]

OR

11.a) Briefly Explain different parameters influencing low power design in detail.
b) What is sequential fault grading? Explain how it is analyzed. [5+5]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Regular Examinations

VLSI Design

(ECE)

Model Paper -IV

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART - A

(25 Marks)

1.a)	What are the advantages of BiCMOS process compare with the CMOS.	[2]
b)	List the fabrication procedures for IC Technologies.	[3]
c)	Draw the VLSI Design Flow.	[2]
d)	Draw the stick diagram for two inputs NOR gate.	[3]
e)	What is switch logic?	[2]
f)	What are the issues involved in driving large capacitive loads in VLSI circuits.	[3]
g)	Design a 2-bit Parity generator.	[2]
h)	What is Booth's algorithm?	[3]
i)	Write the Comparison between FPGA and CPLD.	[2]
j)	What type of faults can be reduced by improving layout design?	[3]

PART - B

(50 Marks)

2.a) Discuss the Basic Electrical Properties of MOS and BiCMOS Circuits.
b) Derive the expression for estimation of Pull-Up to Pull-Down ratio of an n-MOS inverter driven by another n-MOS inverter. [5+5]

OR

3.a) Derive the relationship between I_{ds} and V_{ds}
b) Derive the expression for transfer characteristics of CMOS Inverter. [5+5]

4.a) Explain in detail about the scaling concept in VLSI circuit Design.
b) Draw the Layout Diagrams for NAND Gate using nMOS. [5+5]

OR

5.a) Explain λ-based Design Rules in VLSI circuit Design.
b) Draw the Layout Diagrams for CMOS Inverter. [5+5]

6. Explain the following:
a) Fan-in
b) Fan-out
c) Choice of layers. [10]

OR

7. Describe the following: a) Pseudo-nMOS Logic

8.a) Draw the schematic and logic diagram for a single bit adder and explain its operation with neat diagram.

b) With neat circuit diagram, explain the operation of Barrel shifter. [5+5]

OR

9.a) Explain about Serial access memories.

b) Explain about design of an ALU subsystem in brief. [5+5]

10.a) Explain Architecture of FPGA in detail.

b) What are the draw backs of PLAs? How PLAs are used to implement combinational and sequential logic circuits? [5+5]

OR

11.a) Why stuck-at faults occur in CMOS circuits? Explain with suitable logical diagram.

b) Why the chip testing is needed? At what levels testing a chip can occur? [5+5]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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IV B. Tech I Semester Regular Examinations

VLSI Design

(ECE)

Model Paper -V

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART - A

(25 Marks)

1.a)	Define threshold voltage of a MOS device.	[2]
b)	What are pull-ups and write about the resistor pull-up and its usage.	[3]
c)	Explain about the contact cuts and approaches.	[2]
d)	Represent the Stick diagram of a NMOS inverter.	[3]
e)	Write about the clocked CMOS logic and its usage.	[2]
f)	Explain about the Wiring capacitance and its need.	[3]
g)	Mention about SRAM and its usage.	[2]
h)	Describe about the Serial Access Memories.	[3]
i)	Explain about the principle of Built in Self Test.	[2]
j)	Explain about test Principles used for testing.	[3]

PART - B

(50 Marks)

2.a) Write about BiCMOS fabrication in a n-well process with a diagram.
b) Distinguish between Bipolar and CMOS devices technologies in brief. [5+5]

OR

3.a) Mention about the BICMOS Inverters and alternative BICMOS Inverters.
b) Determine the pull-up to pull down ratio for NMOS inverter driven by another NMOS Inverter. [5+5]

4.a) Discuss about the stick diagrams and their corresponding mask layout examples.
b) Draw the stick diagram of p-well CMOS inverter and explain the process. [5+5]

OR

5.a) Explain about the 2 μm CMOS Design rules and discuss with a layout example.
b) Draw and explain the layout for CMOS 2-input NAND gate. [5+5]

6. Discuss about the logics implemented in gate level design and explain the switch logic implementation for a four way multiplexer. [10]

OR

7.a) Describe about the methods for driving large capacitive loads.
b) Describe about the choice of fan – in and fan – out selection in gate level design. [5+5]

8.a) Design a shift register with the dynamic latch operated by a two-phase clock.
b) Explain the working principle of Ripple carry adder using Transmission Gates. [5+5]

OR

9.a) Explain about the Wallace tree multiplication and its design issues.
b) Draw the circuit diagram of four transistor DRAM cell with storage nodes. [5+5]

10.a) Explain the detailed logic configurable Block Architecture of FPGA.
b) Write a note on the different Parameters influencing low power design. [5+5]

OR

11. Explain the following in detail.
a) Chip level Test Techniques
b) Testability and practices. [5+5]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Regular Examinations

VLSI Design

(ECE)

Model Paper -VI

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART – A

(25 Marks)

1.a)	What is pull up and pull down device?	[2]
b)	Why NMOS technology is preferred more than PMOS technology?	[3]
c)	What are the uses of Stick diagram?	[2]
d)	What is the fundamental goal in Device modeling?	[3]
e)	List out the sources of static and dynamic power consumption.	[2]
f)	Define Fan-in and Fan-out.	[3]
g)	Why is barrel shifter very useful in the designing of arithmetic circuits?	[2]
h)	Write the principle of any one fast multiplier.	[3]
i)	What is programmable logic array?	[2]
j)	What are feed-through cells? State their uses.	[3]

PART – B

(50 Marks)

2.a)	What is meant by latch up problem? How will you prevent.	
b)	Define threshold voltage? Drive the Vt equation for MOS transistor.	[5+5]
	OR	
3.a)	Explain with neat diagrams the various NMOS fabrication technology.	
b)	Draw and explain BiCMOS inverter circuit.	[5+5]
4.	Draw the circuit diagram, stick diagram and layout for CMOS inverter.	[10]
	OR	
5.a)	Explain about the various layout design rules.	
b)	Draw the static CMOS logic circuit for the following expression i) Y= (ABCD)′ ii) Y= [D(A+BC)]′	[5+5]
6.a)	Explain different capacitances present in CMOS design.	
b)	Explain the concept of MOSFET as switches with suitable example.	[5+5]
	OR	
7.	Write short notes on: a) Ratioed Circuits b) Dynamic Circuits.	[5+5]

8.a) Explain the operation of a basic 4 bit adder.
b) Explain the operation of booth multiplication with suitable example. [5+5]

OR

9.a) Design a 1:16 demultiplexer using 1:8 demultiplexers.
b) Draw the structure of a 4×4 static RAM and explain it's operation. [5+5]

10.a) Discuss any two types of programming technology used in FPGA design.
b) Explain ATPG fault models. [5+5]

OR

11.a) What is programmable devices? How it differs from ROM?
b) Explain fault models of VLSI Design. [5+5]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B. Tech IV Year I Semester Examinations
MICROWAVE ENGINEERING
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

MODEL PAPER-I

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a) Draw the field pattern of TE_{10} mode in rectangular waveguide. [2]
b) Sketch microstrip line diagram and indicate important features. [3]
c) Draw the E-plane Tee junction diagram. [2]
d) Find the resonant frequency of an air-filled cavity resonator with dimensions a=5 cm, b=3=cm and d=4 cm. [3]
e) Draw typical Applegate diagram. [2]
f) Explain transit time effect in conventional tubes. [3]
g) What is mode jumping in cavity magnetron / how this can be avoided? [2]
h) Draw the diagram of IMPATT diode and carrier concentration. [3]
i) State the significance of S-Parameters at high frequencies. [2]
j) What are the possible errors in high frequency measurements? [3]

PART-B

(50 Marks)

2.a) Why TEM modes are not possible in hollow rectangular wave guides ?
b) A TE_{10} wave at 10 GHZ propagates in a rectangular wave guide of 1.5 cm × 0.6 cm dimensions filled with medium air. Determine guided wave length and wave impedance. [5+5]

OR

3. Derive the expressions for the field components due to TM waves in a rectangular waveguide. [10]

4.a) Describe the working of H-plane Tee and state why it is called shunt Tee.
b) A directional coupler is having coupling factor =10 dB and directivity = 40dB. Determine the power coupled in forward and reverse direction when input power is 10 W assuming the coupler is lossless. [5+5]

OR

5.a) With the help of diagram ,explain principles and operation of a 3-port circulator.
b) List and explain the characteristics of Ferrites. [5+5]

6.a) With the help of Applegate diagram, explain the bunching process and hence the velocity modulation in Klystron amplifier.

b) State the limitations of conventional tubes at high frequencies. [5+5]

OR

7.a) Classify the various microwave tubes with respect to the orientation of electric and magnetic fields.

b) Explain with neat sketch, the principle of operation of a TWT amplifier and write the equations for the maximum voltage gain and efficiency. [5+5]

8.a) Derive equation for Hull cut-off voltage in a Magnetron.

b) Explain the principle of operation of cavity magnetron and discuss phase focusing effect? [5+5]

OR

9.a) Discuss in detail the principle of operation of GUNN diode considering the two valley model theory and sketch its volt-ampere characteristics.

b) An n-type GaAs GUNN diode has the following specifications:

Threshold field	3kV/cm
Applied field	3.5 kV/cm
Device length	10 micrometers
Doping constant	10^{14} electrons/cm^3
Operating frequency	10 GHz

Calculate the current density (-ve) and electron mobility in the device. [5+5]

10.a) Find the S-matrix of a magic Tee.

b) Explain the double minima method of measuring VSWR. [5+5]

OR

11.a) Describe how the frequency of a given microwave source can be measured Using two different methods.

b) What are the different possible errors that will effect VSWR measurements**?** [5+5]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B.Tech IV Year I Semester Examinations
MICROWAVE ENGINEERING
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

MODEL PAPER-II

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A (25 Marks)

1.a)	Define dominant and degenerative modes of waveguide.	[2]
b)	Write the equation of Q factor of Microstrip line.	[3]
c)	Which is the dominant mode in circular waveguide?	[2]
d)	What is post and what is the application of it?	[3]
e)	Compare 'O' type and 'M' type tubes.	[2]
f)	What are the limitations of conventional tubes?	[3]
g)	How pi-mode is separated in Magnetron?	[2]
h)	How LSA mode of Gunn diode is used to produce oscillations?	[3]
i)	Why S-parameters are needed in Microwave frequencies?	[2]
j)	Why an Isolator is needed in Microwave bench?	[3]

Part-B (50 Marks)

2.a) Derive the field equations for Rectangular Waveguide in TE mode starting from Maxwell's equations.
b) Why TEM wave is not possible in Rectangular waveguide? [5+5]

OR

3.a) Draw the field line for the following modes of Rectangular waveguide
i) TE10 ii) TM11 iii) TM12 iv) TM22
b) Determine the impedance of Rectangular waveguide in TE and TM mode. [5+5]

4.a) What are the different types of Attenuators? Explain them with neat diagrams.
b) Draw the structure diagram of E-plane Tee and explain its characteristics. [5+5]

OR

5.a) Why Matched loads are needed in Microwave circuits? Explain its working with neat diagrams.
b) Explain the principle of Faraday rotation. [5+5]

6. Explain how velocity modulation is converted into current modulation with Applegate diagram and also derive the equation for output power efficiency. [10]

OR

7. Explain how TWT is increased gain by increasing the bunching of electrons and derive the equation of gain. [10]

8.a) Explain how 8-cavity cylindrical Magnetron is used to produce oscillations.
b) What are the applications of Magnetron oscillator? [5+5]

OR

9.a) Explain how Gunn diode is used in waveguide oscillator.
b) What are the different avalanche transit time devices? [5+5]

10. Draw the structure of Magic tee and write its characteristics and also derive its S-matrix. [10]

OR

11. Explain how a slot section is used to measure the frequency of a given microwave signal. [10]

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MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
B. Tech IV Year I Semester Examinations
MICROWAVE ENGINEERING
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

MODEL PAPER-III

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A

(25 Marks)

1.a) Mention the application of waveguides. [2]
b) Write short notes on power transmission and power losses of rectangular waveguide.[3]
c) List out the functions of various waveguide components and their applications. [2]
d) Explain any one application of Magic Tee. [3]
e) Classify microwave tubes. [2]
f) Differentiate two cavity klystron and Reflex klystron. [3]
g) Explain RWH theory. [2]
h) Mention the application of TED's. [3]
i) Explain the significance of scattering matrix. [2]
j) What is the need for an isolator in MW measurements and where it is placed? [3]

Part-B

(50 Marks)

2.a) Explain why TEM mode does not exist in a circular wave guide.
b) What is the significance of Q in resonant circuits? Derive a general expression Q for a series resonant circuit. What happens to Q when circuit is loaded? [5+5]

OR

3.a) Show that TM_{01} and TM_{10} modes does not exist in a rectangular waveguide.
b) A rectangular wave guide with dimension of 8×4 cm operates in the TM11 mode at 10Ghz. Determine the characteristic wave impedance. [5+5]

4.a) What is a cavity resonator? Discuss the applications of cavity resonator.
b) Derive the expression for Q-factor of rectangular cavity. [5+5]

OR

5. Write short notes on:
a) Wave guide phase shifter b) Magic Tee [5+5]

6.a) Draw the mode curves of Reflex klystron and derive the relation between mode number and repeller in Reflex klystron.
b) In a two-cavity klystron the parameters are, input power=10mW, voltage gain=20dB, R_{sh} of input cavity =25KΩ, R_{sh} of output cavity =35KΩ, load resistance = 40 KΩ. Find input voltage, output voltage and the power to the load. [5+5]

OR

7.a) Explain the significance of slow wave structure in the amplification process. List out the major differences between TWT and klystron.
b) Explain how amplification takes place in Helix TWT? [5+5]

8. List and explain different types of magnetrons. [10]

OR

9.a) With a neat sketch explain the structure and principle of operation of TWT amplifier.

b) How is bunching achieved in a cavity magnetron? Explain. [5+5]

10.a) Give the measurement procedure for measuring Q factor of resonant cavity.

b) Define VSWR. Describe the methods for measuring high and low VSWR's. [5+5]

OR

11.a) Explain the procedure for measuring VSWR<10.

b) Explain the procedure for measuring attenuation with neat diagram. [5+5]

R15

Code No: R15A0421

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Regular Examinations, November 2018

Microwave Engineering

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART-A (25 Marks)

1). a	List out the applications of Microwaves.	**[2M]**
b	What is the significance of Q – factor.	**[3M]**
c	Explain about E plane and H Plane Tees.	**[2M]**
d	What do you understand by wave guide discontinuities?	**[3M]**
e	List out the limitations of Conventional tubes at microwave frequencies.	**[2M]**
f	What are ' O type tubes'.	**[3M]**
g	What are the limitations of Gum diode?	**[2M]**
h	Explain about various types of magnetrons .	**[3M]**
i	Define VSWR?	**[2M]**
j	Define cavity resonator.	**[3M]**

PART-B (50 MARKS)

SECTION-I

2	Discuss in detail about Rectangular wave guides – Power transmission and Power losses.	**[10M]**

OR

3	Derive the expression for the field components due to TE waves in a rectangular waveguide.	**[10M]**

SECTION-II

4	Discuss in detail about Ferities Composition and Characteristics.	**[10M]**

OR

5	Enumerate the concepts involved in 2 – hole Directional Coupler.	**[10M]**

SECTION-III

6	Explain in detail about the classification of Microwave tubes.	**[10M]**

OR

7	With the help of Applegate diagram, explain the bunching process and hence the velocity modulation in two cavity Klystron amplifier	**[10M]**

SECTION-IV

8 Enumerate the concepts involved in the cylindrical travelling wave magnetron **[10M]**

OR

9 What are the Gum Oscillation modes and LSA mode and discuss about them. **[10M]**

SECTION-V

10 Explain about various wave guide attenuators. **[10M]**

OR

11 Discuss in detail about various wave guide phase shifters. **[10M]**

******

Code No: **R15A0421**

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B. Tech I Semester Supplementary Examinations, May 2019

Microwave Engineering

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

****

PART-A (25 Marks)

1). a	What are the phase and Group velocities.	**[2M]**
b	List out the functions of wave guides.	**[3M]**
c	What are the applications of Scattering Matrix.	**[2M]**
d	What is the need of Gyrator?	**[3M]**
e	Give the significance of Slow wave structures.	**[2M]**
f	What is Velocity modulation.	**[3M]**
g	Explain about RWH theory.	**[2M]**
h	What are cross – field tubes.	**[3M]**
i	What are the applications of Gunn diode	**[2M]**
j	Define attenuator	**[3M]**

PART-B (50 MARKS)

SECTION-I

2	Explain in detail about Microwave Spectrum and bands. Also, give the significance of each band.	**[10M]**

OR

3	What are TE/TM modes. Give the sketches of TE and TM mode fields in the cross –section and explain.	**[10M]**

SECTION-II

4	Discuss in detail about various Coupling mechanisms.	**[10M]**

OR

5	Explain about the Isolator and Circulator.	**[10M]**

SECTION-III

6	Draw the diagram of TWT and explain its structures and operation in detail.	**[10M]**

OR

7	Explain about the velocity modulation process and give the significance of Applegate diagram.	**[10M]**

SECTION-IV

8	What are the Hull cutoff and Hartree conditions and cross field effects.	**[10M]**

OR

9	List out the salient features and applications of Microwave semiconductor devices.	**[10M]**

SECTION-V

10	With a neat diagram, describe the Microwave bench its features, components and function.	**[10M]**

OR

11	Explain in detail about measurement of VSWR	**[10M]**

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R15

Code No: R15A0422

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
IV B. Tech I Semester Supplementary Examinations, May 2019
Cellular & Mobile Communications
(ECE)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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PART-A (25 Marks)

1). a	Define coherence bandwidth.	**[2M]**
b	What are the 4G cellular wireless systems? What are the advantages over 3G?	**[3M]**
c	What parameters are required to design an antenna system?	**[2M]**
d	Differentiate frequency and time diversity.	**[3M]**
e	Define reflection and Diffraction.	**[2M]**
f	How to calculate phase difference between direct and reflected paths?	**[3M]**
g	Which type of antennas are mostly used for mobile phone?	**[2M]**
h	What is the significance of umbrella pattern antennas?	**[3M]**
i	Define handoff.	**[2M]**
j	What are the advantages of handoff	**[3M]**

PART-B (50 MARKS)

SECTION-I

2	What are the limitations in conventional systems? Explain the principle and operation of basic cellular system	**[10M]**

OR

3	a) Define Co-Channel Interference. Derive expression for co-channel interference reduction factor.	**[6M]**
	b) Consider the AMPS in which C/I of 18dB is required for the accepted voice quality. What should be the cluster size of the system. Assume path loss slope=4.What will be the cluster size of the GSM in which the C/I of 12 dB is required?	**[4M]**

SECTION-II

4	How can we measure co-channel interference in real time?	**[10M]**

OR

5	a) Explain the concept of Near end far end interference.	**[5M]**
	b) How the coverage area and interference effected by power and antenna size decrease?	**[5M]**

SECTION-III

6	a) What is the effect of Human made structures and natural structures in signal transmission?	**[5M]**
	b) How the signal reflections take place in flat and hilly terrain?	**[5M]**

OR

7	Derive the mathematical expression for mobile propagation over water and flat open area.	**[10M]**

SECTION-IV

8	Write short notes on a) space diversity antenna	**[5M]**
	b) umbrella pattern antenna	**[5M]**
	OR	
9	a) Explain setup, access and paging channels	**[5M]**
	b) What are the vectorization methods of the cell configuration?	**[5M]**

SECTION-V

10	a) what are the handoff initiation techniques? Explain in detail.	**[5M]**
	b) Differentiate hard handoff and soft handoff.	**[5M]**
	OR	
11	a)Explain intersystem handoff ?	**[5M]**
	b) Write short notes on MAHO .	**[5M]**

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MODEL PAPER –I

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I Semester Examinations

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A **25 Marks**

1) a) Mention the elements of basic cellular systems. [2M]
   b) What is interference and co-channel interference? [3M]
   c) Comment on the lowering antenna height method in a valley. [2M]
   d) What is channel combiner? [3M]
   e) What are the three main types of point-to-point model? [2M]
   f) Define space diversity technique. [3M]
   g) What is meant by frequency management? [2M]
   h) Define paging channel. [3M]
   i) Draw a simple two-level handoff scheme diagram. [2M]
   j) Define dropped call. [3M]

PART-B **50 Marks**

2) a) What are the limitations of conventional mobile telephone system? Describe the various Generations of wireless mobile communication?
   b) What are the Main advantages and disadvantages of various cellular structures?

(OR)

3) a) What is the need of Frequency reuse? Prove that for a hexagonal geometry the co-channel reuse ration is $(3N)^{1/2}$ where $N=i^2+ij+j^2$.
   b) Determine the number of cells in cluster for the following values of the shift Parameters I and j in a regular hexagon geometry pattern:
   (i) i=2 and j=4 (ii) i=3 and j=3

4) a) What are the different interferences in cellular systems? Explain each with diagrams b) Explain how a diversity receiver reduces the interference.

(OR)

5) Discuss in detail
   a) The propagation in near distance
   b) Long distance propagation

6) a) Explain the effects of human made structures for mobile propagation in open area .
b) What is mean by foliage? Explain Foliage loss.

(OR)

7) a) Explain the sum-and-difference patterns and their synthesis in detail.
b) Explain the design aspects and merits of an omni-directional antenna in cell site.

8) Describe the concept of frequency management concern to numbering the channels and Grouping into the subset

(OR)

9) Explain the channel assignment to the cell sites based on the adjacent channels.

10) a) What are the various methods of delaying handoff? Explain briefly.
b) What is meant by dropped call? Explain the factors that influenced dropped call rate.

(OR)

11) What are the various handoff strategies based on algorithms of handoff? Explain in detail.

MODEL PAPER –II

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I Semester Examinations

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A **25 Marks**

1)

a) How voice quality can be tested. [2M]

b) What are advantages of frequency reuse? [3M]

c) Define co-channel interference. [2M]

d) What is known as near end-far-end interference? [3M]

e) Write a short note on signal reflections in a flat terrain. [2M]

f) Write short note on umbrella antenna pattern. [3M]

g) Define voice channel and SAT? [2M]

h) What is meant by fixed channel assignment? [3M]

i) What are the types of handoff? [2M]

j) Write short note on inter system handoff. [3M]

PART-B **50 Marks**

2) a) Describe the principle of Operation of cellular mobile system and explain the cellular Concept with neat diagram.

(OR)

3) a) What are the various components in a cellular system? Explain.
b) List the various techniques used to expand the capacity of a cellular system

4) a) How the interference is different from noise in cellular system? explain
b) What are the different types of interference for a cellular system in detail?

(OR)

5) a) Explain the types of non-co-channel interferences in cellular system.
b) Distinguish Co-channel interference and Non Co-channel interference.

6) a) Describe the form of a point to point model and explain its types.
b) Explain the mobile signal propagation over water and flat area

(OR)

7) a) What is known as directional antennas? Explain directional antennas for interference in detail.

b) Explain space diversity antennas in detail.

8) What is the importantcnce of frequency management chart? Give the structure of the channels in 800 MHz system with frequency ranges?

(OR)

9) Explain clearly different channel assignments and its importance in mobile communications or in brief frequency management in mobile communications?

10) a)What is meant by handoff ?describe the classification of handoff process ?

b) What is meant by handoff initiation? Explain different methods of Handoff initiation with suitable diagrams.

(OR)

11) a) Explain about the handoff and power control?

b) Explain about inter MSC Handoff?

MODEL PAPER –III

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I Semester Examinations

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A **25 Marks**

1)

a) What is known as circuit merit? [2M]

b) Define cell splitting. [3M]

c) What are the types of diversity? [2M]

d) What is frequency-agile combiner? [3M]

e) Write the equation of effective antenna height gain. [2M]

f) What is known as abnormal antenna configuration? [3M]

g) Write short note on set-up channels. [2M]

h) Differentiate channel sharing and borrowing. [3M]

i) Define soft handoff. [2M]

j) What is a MAHO? [3M]

PART-B **50 Marks**

2) a) Briefly describe the concept of mobile radio environment.
b) What are the advantages of digital cellular system over analog cellular system?

(OR)

3) a) Derive the desired C/I for a Normal case in an Omni directional antenna system
b) Explain about mobile fading characteristics.

4) a) What are the different types of Non co-channel interference in a cellular system? Explain
b) Explain the effects of antenna design Parameters for the interference in a cellular system

(OR)

5) a) Explain the co-channel interference reduction factor and derive the general formula for C/I.
b) What are the various techniques to measure CCI? Explain in detail

6) a) Explain the mobile radio propagation over water and flat open area and write the general expression.
b) Describe the effect of antenna height in near and long distance mobile propagation.

(OR)

7) Explain
   a) Umbrella pattern antenna.
   b) Space diversity antennas.
8) Describe the grouping of the voice, set-up and paging channels.

(OR)

9) Explain in detail the fixed channel and non fixed channel assignment?
10) a) Explain different handoff strategies and its importance in different situations.
    b) How to improve call drop rate.

(OR)

11) Write a short notes on
    a) Forced Handoff
    b) Inter System Handoff

MODEL PAPER –IV

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I Semester Examinations

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A **25 Marks**

1)

a) Define fading effect. [2M]

b) What is meant by first-tier of interference? [3M]

c) If co-channel interference reduction factor q is 6 what will be the cluster site? [2M]

d) What is cross talk? [3M]

e) Draw the diagram of human made structures to find propagation path loss curve. [2M]

f) What is meant by difference pattern? [3M]

g) What is known as FOCC? [2M]

h) Define sectorization. [3M]

i) Comment on two-hand off level algorithm. [2M]

j) What is known as delaying handoff? [3M]

PART-B **50 Marks**

2) a) What is the uniqueness of mobile radio environment?Explain.
b) Explain the significance of fading of fading in mobile environment.

(OR)

3) a) Explain Cell splitting and Concept of frequency channels
b) Explain co-channel interference with first tier and second tier example

4) a) Derive the expression for carrier to interference Ratio in a cellular system for a normal case and worst case scenario with an Omni directional antenna.
b) Determine the minimum cluster size for a cellular system designed with an acceptable value of C/I=18dB. Assume the path Loss exponent as 4 and co channel interference at the mobile unit from 6 equidistant cells in the first tier.

(OR)

5) a) Explain the causes for near to far end interference.
b) Mention different systems to reduce the interference.

6) a) Explain the effect of antenna pattern on the interference at the base station and mobile unit .

b) Explain in detail about near and long distance mobile propagation

(OR)

7) a)Describe the various steps involved in finding antenna height gain in mobile environment
   b) Explain umbrella pattern antenna and Omni-directional antennas in detail.
8) Write short notes on
   a) channel sharing and barrowing
   b) Fixed channel assignment

(OR)

9) What type of messages is received to the setup channels when mobile unit monitors strongest signal strength?
10) a)Write notes on power difference handoffs
    b) Explain a two level handoff scheme with suitable example

(OR)

11) a) What is meant by call drop? Explain and suggest methods to reduce call drop rate. b) Write short notes on different types of hand off mechanisms.

MODEL PAPER –V

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV B.Tech I Semester Examinations

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics & Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART-A **25 Marks**

1)

a) Give two advantages of cellular mobile systems over telephone systems. [2M]

b) Define micro cells. [3M]

c) If co-channel interference reduction factor q is 5.2 and the cluster size is q what will be the carrier to interference ratio. [2M]

d) What are the methods to reduce adjacent channel interferences? [3M]

e) Draw the simple model for propagation over water. [2M]

f) Write short note on high-gain broadband umbrella pattern antenna. [3M]

g) Write short note on non-fixed channel assignment. [2M]

h) What is known as access channels? [3M]

i) What is known as dropped call rate? [2M]

j) Write short note on initiation of handoff. [3M]

PART-B **50 Marks**

2) a) What is the uniqueness of mobile radio environment? Explain.
   b) Explain the call initialization, call progress and call termination process.

(OR)

3) a) Explain the normal case of carrier to interference ratio with Omni-directional antenna. b) What is cell-splitting? Explain its types in detail

4) a) discuss in details the various techniques to measure co channel interference, prove that the real time co channel interference measurement is difficult to achieve

(OR)

5) a) Explain non-co-channel interference effects on coverage and interferences.
   b) Explain the effects of coverage and interference by power decrease and decrease antenna height.

6) a) What are the different propagation models available for mobile communication, Explain?
   b) Explain the phase difference between direct and reflected paths in detail.

(OR)

7) Explain about minimum separation of cell-site receiving antennas
8) Elaborate dynamic channel assignment and compare its advantages and disadvantages with the fixed channel assignment

(OR)

9) What is known as dynamic channel assignment average blocking and handoff blocking? Explain.
10) a) Explain MAHO and soft handoff techniques.

    b) Explain "Dropped call rate" in detail.

(OR)

11) Write a short note on
    a) Delayed handoff
    b) Inter systems Handoff
    c) Power difference Handoff

MALLAREDDY COLLEGE OF
ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

QUESTION BANK

(COMPUTER NETWORKS)

By

Dr. C. Ravi Shankar Reddy

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

IV Year B.Tech. ECE-I Sem	**L**	**T/P/DC**
	4	**1/ - /- 3**

(R15A0514) COMPUTER NETWORKS

OBJECTIVES:

The students will be able to:

1. Build an understanding of the fundamental concepts of computer networking.
2. Familiarize the student with the basic taxonomy and terminology of the computer networking area.
3. Introduce the student to advanced networking concepts, preparing the student for entry Advanced Courses in computer networking.
4. Allow the student to gain expertise in some specific areas of networking such as the design and Maintenance of individual networks.

UNIT I:

Introduction: Introduction to networks, Internet, Protocols and Standards, The OSI model, Layers in OSI Model, TCP/IP Suite, Addressing.

Physical Layer: Physical Layer Introduction, Transmission media.

UNIT II:

Data link layer: Introduction, Cyclic codes, checksum, Framing, Flow and error control, HDLC, Point to point protocols

Media Access Sub Layer: Random Access, Controlled access, channelization

UNIT III:

Ethernet, Fast Ethernet, Giga bit Ethernet, wireless LANS, Connecting lans, Backbone networks, Virtual lans, Wireless wans

UNIT IV:

Network Layer: Logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, Forwarding, Unicast routing protocols, multicast routing protocols

UNIT V:

Transport Layer: Process to process delivery, TCP and UDP protocols, SCTP ,Data traffic , congestion, Congestion Control, QoS, integrated services, Differentiated services, QoS in Switched networks.

Application Layer: Domain name space, DNS in internet , Electronic Mail, FTP, WWW, HTTP, SNMP

TEXT BOOKS:

1. Data Communications and Networking- Behrouz A Forouzan Fourth Edition TMH, 2006.
2. Computer Networks- Andrew S Tanenbaum, 4th Edition, Pearson Education

REFERENCE BOOKS:

1. An Engineering approach to computer Networks- S.Keshav, 2nd Edition, Pearson Education
2. Computer and communication Networks- Nader F Mir, Pearson Education
3. Data and Computer Communications, G.S.Hura and M. Singhal, CRC Press, Taylor and Francis Group.
4. Data Communications and Computer Networks,P.C.Gupta, PHI
5. Computer Networking : A top-down Approach Featuring the Internet, James F.Kurose, K.W.Rose, 3rd Edition, Pearson Education

OUTCOMES:

1. Have a good understanding of the OSI Reference Model and in particular have a good knowledge of Layers 1-3.
2. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies
3. Specify and identify deficiencies in existing protocols, and then go onto formulate new and better protocols
4. Have an understanding of the issues surrounding Mobile and Wireless Networks.
5. Have a working knowledge of datagram and internet socket programming

MODEL PAPERS

Code No: R15A0514

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

B. Tech IV Year I Semester Examinations
Computer Networks
(Electronics Communication and Engineering)

Time: 3hours **Max Marks: 75**

Note: This question paper contains two sections Part-A and Part B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of questions from five units. Answer **any one full** question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

1. a. What is protocol and list the elements of protocol. (2M)
b. How many types of standards are there? Explain them. (2M)
c. List various services provided by data link layer to network layer. (3M)
d. For the given data 01101111111111111111110010 explain the processes of bit stuffing and bit destuffing. (3M).
e. Draw 802.3 frame format. (2M)
f. Compare and contrast fast Ethernet and Giga bit Ethernet. (3M)
g. what are the differences between subnetting and supernetting. (2M)
h. What is an autonomous system? Explain (3M)
i. What do you mean by processes to processes delivery? Explain. (2M)
j. What are java applets?Explain (3M)

PART-B

2. Explain ISO OSI Reference model with neat sketch. (14M)

(OR)

3. Explain different kinds of Transmission Media. (14M)

4. Explain CSMA and CSMA/CD in detail. (14M)

(OR)

5. a) What do you mean by bit stuffing and why it is employed. (7M)
b) Explain error detection using Checksum. (7M)

6. a) Compare and contrast TDM, STDM and FDM. (14M)

b) What are the common Fast Ethernet implementations? Give the purpose of NIC (7M)

(OR)

7. a) Explain indetail about different Bluetooth layers. (7M)

b) What are the advantages of dividing an Ethernet LAN with a bridge? Give the relationship between a switch and a bridge (7M)

8. a) With the aid of necessary explain in detail about significance of tunneling. (7M)

b) Explain DHCP. (7M)

(OR)

9. a) Write short notes on Link state routing. (7M)

b) Explain the process of physical address to logical address mapping using Boot Strap Protocol. (7M)

10. a) Explain UDP header format. (7M)

b) Write short notes on congestion control. (7M)

(OR)

11. Explain the following

a) FTP (7M)

b) DNS (7M)

Code No: R15A0514

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

B. Tech IV Year I Semester Examinations
Computer Networks
(Electronics Communication and Engineering)

Time: 3hours **Max Marks: 70**

Note: This question paper contains two sections Part-A and Part B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of questions from five units. Answer **any one full** question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

1. a. Compare and contrast LAN. MAN and WAN. (3M)
   b. List out different kinds of addresses that are employed in TCP/IP model. (2M)
   c. List out different types of framing mechanisms that are employed in data link layer. (3M)
   d. Compare and contrast error detection codes and error correction codes. (3M)
   e. What are functions of DCF and PCF. (3M)
   f. What are the differences between piconet and scatter net. (2M)
   g. What are the differences between multicasting and multiple casting? Explain. (2M)
   h. What do you mean by tunneling. (2M)
   i. What are the problem with integrated services. (3M)
   j. What do you mean by socket? Explain (2M)

PART-B

1. Explain TCP/IP Protocol Suit with neat sketch and list out differences between TCP/IP and OSI model (14M)

(OR)

2. Write short notes on internet. (14M)

3. a) Explain about services provided by PPP and also list out the services that are not provided by PPP. (7M)
   b) Explain Pure and derive expression for its throughput. (7M)

(OR)

4. a) Explain about different strategies that are employed under controlled access. (6M)
   b) Explain in detail about working of TDMA and also list out differences between TDMA, FDMA and CDMA. (8M)

5. a) Write short notes on giga bit ethernet. (8M)
   b) Explain in detail about hidden and exposed node problems in wireless lans (6M)

(OR)

6. What do you mean by virtual lan and explain in detail about configuring and maintaing data of virtual lans. (7M)
   With the aid of suitable example explain about frequency reuse principle. (7M)

7. a) Explain in detail about IGMP. (7M)
   b) Is multicast routing is same as multiple unicast routing, Explain. And also write short notes on MOSPF (7M)

(OR)

8. a) Explain Transport layer Connection Establishment and Connection Release. (7M)
   b) Explain Transport protocol addressing. (7M)

9. a) Explain TCP header format. (7M)
b) Explain TCP Congestion Control. (7M)

(OR)

10. Explain the following
    a) SMTP (7M)
    b) HTTP (7M)

Code No: R15A0514

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

B. Tech IV Year I Semester Examinations
Computer Networks
(Electronics Communication and Engineering)

Time: 3hours **Max Marks: 70**

Note: This question paper contains two sections Part-A and Part B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of questions from five units. Answer **any one full** question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

1. a. List two advantages and disadvantages of having international standards for network, Protocols? (2M)
   b. What are the advantages of twisted pair over two-wire line. (2M)
   c. Data link protocols almost always put the CRC in a trailer, rather than in a header. Why? (3M)
   d. What is slotted ALOHA? Mention its advantages. (3M)
   e. List out the functions of bridge. (3M)
   f. compare and contrast GEO, MEO, and LEO. (3M)
   g. Compare and contrast transparent and non transparent fragmentation. (2M)
   h. List out drawbacks of link state routing. (3M)
   i. What are the two main categories of DNS messages? (2M)
   j. How congestion avoidance is different from congestion control. (2M)

PART-B

1. a) Explain in detail about layering scenario. (6M)
   b) Write short notes on different levels of addressing mechanism employed in internet (8M)

(OR)

2. Explain different kinds transmission media used for internet. (14M)

3. a) Explain error detection using CRC for the following. Consider a message 110010 represented by the polynomial $M(x) = x5 + x4 + x$ and a generating polynomial $G(x) = x3 + x2 + 1$ (1101) (7M)
   b) Explain in detail about different fields present in PPP frame format. (7M)

(OR)

4. a) Draw and explain HDLC frame format and also explain about different types of frames used in HDLC. (8M)

   b) Explain how slotted aloha improves the performance of pure aloha (7M)

5. a) Discuss briefly about the MAC layers in the 802.11 standard. (7M)

   b) Explain in detail about the Physical layer in the Fast Ethernet. (7M)

(OR)

6. a) Describe in detail about the Frequency Division Multiple Access. (14M)

   b) What is learning bridge and explain in detail about the process of learning of learning bridge (7M)

7. a) Write short notes on IPV6 addresses. (7M)

   b) Explain indetail about message format and different types of error reporting messages of ICMP. (7M)

(OR)

8. With a suitable example explain Distance Vector Routing algorithm. What is the serious drawback of Distance Vector Routing algorithm? Explain. (14M)

9. a) Explain TCP header format. (7M)

b) What is WEB Documents? Explain with its categories. (7M)

(OR)

10. a)Write short notes on SMTP (7M)

    b) Write short notes of different techniques that are employed to improve QoS (7M)

Code No: R15A0514

MALLA REDDY COLLEGE OF ENGINEERING &TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

B. Tech IV Year I Semester Examinations
Computer Networks
(Electronics Communication and Engineering)

Time: 3hours **Max Marks: 70**

Note: This question paper contains two sections Part-A and Part B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of questions from five units. Answer **any one full** question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

1. a. Name any four international standard organizations. (2M)
   b. Explain peer to peer process. (2M)
   c. Compare and contrast flow control and error control. (3M)
   d. What is vulnerable time? explain (3M)
   e. Is an amplifier can be repeater. Explain. (2M)
   f. List out differences between BSS and ESS. (2M)
   g. What are different types of autonomous systems? Explain. (3M)
   h. What are the limitations of classful addressing. (3M)
   i. List out the characteristics of QoS? (2M)
   j. What are the functions of e-mail. (3M)

PART-B

1. a) Explain in detail about layering scenario. (6M)
   b) Write short notes on different levels of addressing mechanism employed in internet (8M)

(OR)

2. Explain different kinds transmission media used for internet. (14M)

3. a)Given 1101011011 data frame and generator polynomial G(x) = x4 + x + 1. Derive the transmitted frame (7M)
   b) Explain in detail about CSMA/CA. (7M)

(OR)

4. a) Explain in detail about CSMS/CD (8M)
   b) Give a brief note on the Multilink Point to point protocol (7M)

5. a) Why there is no need for CSMA/CD on a full-duplex Ethernet LAN? Explain. (14M)
   b) Write short on back bone networks. (7M)

(OR)

6. a) Describe in detail about the CDMA. (7M)
   b) Write short notes on IEEE 802.11 (7M)

7. a) Explain briefly about the shortest path routing algorithm. (6M)
   b) Explain indetail about classfull addressing and classless addressing. (8M)

(OR)

8. a) What is Count to infinity problem? Explain with suitable example. (7M)
   b) Write short notes on internetworking (7M)

9. a) Draw frame format of SCTP and discuss indetail about each field. Also list out differences between SCTP and TCP. (7M)
b) Write short notes of different techniques that are employed to improve QoS (7M)

(OR)

10. a) List out the different fields that are missing in TCP header as compared to that of UDP and give the reasons for their missing. (7M)
    b) What is WEB Documents? Explain with its categories. (7M)

PREVIOUS QUESTION PAPERS FROM

OTHER UNIVERSITIES (JNTUH-2016 & 2017)

Code No: 117BY

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 2016

COMPUTER NETWORKS

(Common to ECE, BME)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

1.a)	Write short notes on interfaces.	[2]
b)	Explain the characteristics of twisted pair cable.	[3]
c)	What is the difference between router and gateway?	[2]
d)	What is meant by collision free protocols?	[3]
e)	Mention the design issues of network layer.	[2]
f)	Difference between connectionless and connection oriented networks.	[3]
g)	Explain about CIDR.	[2]
h)	Explain the functions of Transport layer.	[3]
i)	Explain about TELNET.	[2]
j)	Write the application layer paradigms.	[3]

PART-B

(50 Marks)

2.a) Explain the functions of various layers in ISO-OSI reference model.
b) Explain the term sliding window. Also illustrate and explain the operation of selective repeat. [5+5]

OR

3.a) Discuss about unguided transmission media.
b) What are the different types of error detection methods? Explain the CRC error detection technique using generator polynomial x^4+x^3+1 and data 11100011. [5+5]

4.a) Explain the operation of source Routing Bridges.
b) Explain the working of CSMA/CD. [5+5]

OR

5.a) Discuss in brief the MAC frame structure for IEEE 802.3
b) Explain in detail the operation of pure ALOHA and slotted ALOHA. [5+5]

6.a) Explain the Dijkstra's Shortest Path Routing Algorithm with an example.
b) Give the general principles of various congestion control algorithm. [5+5]

OR

7. What is Congestion control? How it is implemented in Network Layer? What is the role of Choke packet in managing congestion? [10]

8.a) Explain the error control mechanism in transport layer.
b) Explain about Reverse Address Resolution Protocol. [5+5]

OR

9.a) How are connection establishment and connection release managed at the transport layer? Explain.
b) With a neat diagram explain the IPv6 header format. [5+5]

10.a) Compare and Contrast the UDP header and the TCP header.
b) Explain the client server model. [5+5]

OR

11.a) What is Electronic mail? Explain the two scenarios of architecture of E-Mail.
b) Explain the TCP service model. [5+5]

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Code No: 117BY **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year ISemester Examinations, November/December - 2017
COMPUTER NETWORKS
(Common to ECE, EIE, BME)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A

(25 Marks)

1.a)	What is CRC checker?	[2]
b)	Write the advantages of layered architecture of network.	[3]
c)	Define exponential Back off.	[2]
d)	What is piggy backing? How does it useful?	[3]
e)	Write the functions of LLC.	[2]
f)	Write the responsibilities of network layer.	[3]
g)	What is multiplexing? Give different types of multiplexing?	[2]
h)	Write about Tunneling.	[3]
i)	What is DNS? Write its properties.	[2]
j)	Explain MIME header	[3]

Part-B

(50 Marks)

2.a)	Compare TCP/IP and OSI reference model.	
b)	Explain about framing.	[5+5]
	OR	
3.a)	Explain stop and wait protocol.	
b)	Give a detail note on Hamming code.	[5+5]
4.a)	Explain CSMA/CD protocol and how does it detect collision?	
b)	Discuss about switched and fast Ethernet.	[5+5]
	OR	
5.a)	Explain MAC sub layer protocol in detail.	
b)	Discuss about spanning tree bridges.	[5+5]
6.a)	Explain link state routing algorithm in detail.	
b)	Write the optimality principle of routing algorithms.	[5+5]
	OR	
7.a)	Describe hierarchical routing algorithm in detail.	
b)	Write a note on load shedding.	[5+5]

8.a)	Explain IPV6 packet format.	
b)	Describe fragmentation in internet working with an example.	[5+5]
	OR	
9.a)	Explain Address resolution protocol in detail.	
b)	Write the principles of network layer in internet.	[5+5]
10.a)	Explain TCP sliding window protocol.	
b)	Give a detail note on HTTP request-response model.	[5+5]
	OR	
11.a)	Explain File transport protocol.	
b)	Compare TCP and UDP protocols.	[5+5]

R13

Code No: 117BY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, March - 2017

COMPUTER NETWORKS

(Common to ECE, EIE, BME)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A (25 Marks)

1.a)	How selective repeat protocol resolves issues of stop and wait protocol?	[2]
b)	What are the applications of Infrared waves?	[3]
c)	Mention some of the physical properties of Ethernet.	[2]
d)	Explain the function of repeaters.	[3]
e)	What are the metrics used by routing protocols.	[2]
f)	How does netid differ from a network address.	[3]
g)	Explain briefly about Crash recovery.	[2]
h)	Explain about Packet Fragmentation.	[3]
i)	What are the basic functions of email systems?	[2]
j)	What are the two main categories of DNS messages?	[3]

Part-B (50 Marks)

2.a)	Explain about the Coaxial Cable with neat sketch.	
b)	What is bit and byte stuffing explain with an example.	[5+5]
	OR	
3.a)	Explain the frame format of PPP.	
b)	Draw the layered architecture of the OSI reference model and write two services provided by each layer of the model.	[5+5]
4.a)	Explain the flow diagram of CSMA/CD.	
b)	Explain about the source routing bridge.	[5+5]
	OR	
5.a)	Explain about channelization protocols.	
b)	Explain the categories of standard Ethernet.	[5+5]
6.	Explain about the Distance Vector routing protocol with an example.	[10]
	OR	
7.	Explain about the Link State routing algorithm.	[10]
8.	Explain about DHCP.	[10]
	OR	
9.a)	Explain about CIDR.	
b)	Explain about RARP.	[5+5]
10.	Explain the various fields of the TCP header with the help of a neat diagram.	[10]
	OR	
11.a)	Explain about the window management in TCP.	
b)	Explain about HTTP request.	[5+5]

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Code No: 09A70403 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, June/July- 2014
COMPUTER NETWORKS
(Common to ECE, EIE, BME, ECM)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

\- - -

1.a) Write any four reasons for using layered protocols.
b) Explain the functionality of each layer in OSI reference model.

2.a) If the bit string 0111101111101111110 is bit stuffed. What is the output of the string?
b) What is the reminder obtained by dividing x^7+x^5+1 by the generator x^3+1?

3.a) With an example, explain the importance of sequence number for Acknowledgements.
b) Explain stop-and-wait protocol.

4. What is a token? Discuss the protocol of token ring LAN in general. Explain with an example how priority is implemented in a token ring LAN?

5.a) Describe design goals, architecture and switching mechanisms of ATM networks.
b) Explain the functions of following devices:
i) Hub ii) Bridge iii) Router iv) Gateway.

6.a) The major problem with distance vector algorithm is 'count to infinity'. How exchange of complete path from router to destination instead of delay, helps in solving count to infinity problem.
b) What are the advantages of adaptive routing approach over non adaptive routing?

7. Write short notes on:
a) Admission control
b) Choke packet
c) Load shedding
d) Jitter control.

8. What is DNS? Explain its usage and its working?

PREVIOUS QUESTION PAPERS FROM

OTHER UNIVERSITIES (JNTUK-2018)

III B. Tech II Semester Regular Examinations, Feb-2018

COMPUTER NETWORKS

(Common to CSE and IT)

Time: 3 hours | Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A

1	a)	Write about connection oriented service-reliable communication	[4M]
	b)	Explain circuit switching technology implementation in Telephone networks.	[3M]
	c)	With suitable example explain internet checksum.	[4M]
	d)	How to route the packets in virtual circuit subnets?	[4M]
	e)	Describe various access methods in standard Ethernet.	[4M]
	f)	What is URL? How it will be processed? Explain.	[3M]

PART –B

2	a)	Give the structure and working principle of WAN with virtual private networks and Internet Service Provider. And also explain its role in Internet.	[8M]
	b)	Write about peer-to-peer processes and encapsulation concepts in OSI model.	[8M]
3	a)	Describe the functional differences between statistical and synchronous time division multiplexing.	[8M]
	b)	With four switches draw the architecture of datagram networks and explain the data transfer between nodes.	[8M]
4	a)	Show the generation of codeword at the sender site and check the same at the receiver site using CRC where data word is 101001 1010 and the deviser is 10111.	[8M]
	b)	"In Selective Repeat ARQ, the size of the sender and receiver window must be at most one-half of 2^m justify the statement.	[8M]
5	a)	With example explain routing process in hierarchical routing.	[8M]
	b)	Explain all variations of "sense before transmit" methods used in multiple access.	[8M]
6	a)	What are the addressing mechanisms followed in IEEE802.11. How it solves hidden station and exposed station problem.	[8M]
	b)	Explain the MAC sub layer and physical layer specifications in high speed LAN.	[8M]
7		Explain the following with respect to HTTP	
	a	Operational Model	[6M]
	b	Request message format	[5M]
	c	Reply message format.	[5M]

Code No: RT32053 **R13** SET - 2

III B. Tech II Semester Regular Examinations, Feb-2018
COMPUTER NETWORKS
(Common to CSE and IT)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART – A

1	a)	Write the characteristics of Wide Area Networks.	[3M]
	b)	What are the design issues of physical layer?	[4M]
	c)	Differentiate the process of error correction and error detection in block coding.	[4M]
	d)	Write about the vulnerable time period in slotted ALOHA protocol.	[4M]
	e)	With an example explain variations of Manchester encoding.	[4M]
	f)	Explain the architecture of browser- server.	[3M]

PART – B

2	a)	Differentiate services, mechanisms and interfaces with respect to OSI and TCP/IP protocol suits.	[8M]
	b)	What is network hardware? Explain in detail with respect to transmission technology and scale of networks.	[8M]
3	a)	What is the difference between the routing process in datagram networks and in virtual circuit networks? Explain	[8M]
	b)	Write about the multiplexing and de-multiplexing process in frequency division multiplexing	[8M]
4	a)	What is sliding window? How it is used in noisy channels for error control.	[8M]
	b)	Write the sender site and receiver site algorithm for simplest protocol and stop and wait protocols.	[8M]
5	a)	Explain the optimality principle with respect to shortest path algorithm	[8M]
	b)	What is channelization? Explain any two channelization techniques.	[8M]
6	a)	Describe the architecture and physical layer specifications of f IEEE802.11 standard.	[8M]
	b)	Write the differences between bridged Ethernet, switched Ethernet and full duplex Ethernet.	[8M]
7	a)	In detail write about WAP protocol implementation for wireless Web.	[8M]
	b)	With neat sketch explain the formats of generic messages in HTTP. How security is provided for HTTP messages.	[8M]

Code No: RT32053 **R13** SET - 3

III B. Tech II Semester Regular Examinations, Feb-2018
COMPUTER NETWORKS
(Comm to CSE and IT)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A

1	a)	Write about the original ARPANET design.	[3M]
	b)	Write short notes on frame synchronization in TDM.	[4M]
	c)	Differentiate character oriented and bit oriented protocols.	[4M]
	d)	Write a short notes on persistence methods	[4M]
	e)	Discuss the addressing mechanisms of wireless LANs.	[4M]
	f)	What is proxy server? How it is related to HTTP.	[3M]

PART –B

2	a)	Differentiate the following with respect to OSI Layers functionality i) Logical Address ii) Physical Address iii) Service Point address	[8M]
	b)	Describe different types of networks we encounter in the world today. And also differentiate point-to-point WAN and switched WAN.	[8M]
3	a)	What are different multiplexing techniques used for analog signals? Explain.	[8M]
	b)	Write the characteristics of virtual circuit networks and explain source to destination data transfer in it.	[8M]
4	a)	Show that the maximum window size in selective repeat is $2^n/2$ and go-back-n is 2^n-1, where n is the number of bits used for fame sequence number.	[8M]
	b)	How to determine the type of the frame in HDLC protocol? Explain with frame format.	[8M]
5	a)	What is random access? Explain how it can be achieved with pure ALOHA and slotted ALOHA.	[8M]
	b)	How to solve the problem of gigantic forwarding tables? Propose and explain some routing algorithms.	[8M]
6	a)	Explain frame format, addressing mechanisms and access methods in standard Ethernet.	[8M]
	b)	How to use handshaking mechanism to prevent hidden station and exposed station problem. Explain.	[8M]
7	a)	Differentiate static, dynamic and active documents used in World Wide Web.	[8M]
	b)	Explain various status codes used in HTTP protocol.	[8M]

Code No: RT32053 **R13** SET - 4

III B. Tech II Semester Regular Examinations, Feb-2018
COMPUTER NETWORKS
(Comm to CSE and IT)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

*****

PART –A

1	a)	Describe store and forward networks.	[3M]
	b)	What is the role of routing table in datagram networks?	[4M]
	c)	How to achieve flow control and error control in data link layer.	[4M]
	d)	What is the role of coding theory in code division multiplexing technique?	[4M]
	e)	Differentiate basic service set and extended service set.	[4M]
	f)	Write about various components of URL.	[3M]

PART –B

2	a)	With neat sketch discuss the functionalities of each layer in TCP/IP protocol suite.	[8M]
	b)	Write short notes on the Novel Netware architecture. How it helps in internet evolution?	[8M]
3	a)	What is virtual circuit identifier? How it is used in setup and tear down phases. Explain with suitable example.	[8M]
	b)	Explain how wavelength division multiplexing works. What are its advantages over other methods?	[8M]
4	a)	Explain the design and implementation of stop and wait protocol.	[8M]
	b)	Write about services, framing and multiplexing concepts of Point-Point Protocol.	[8M]
5	a)	Discuss the following: i) Broadcast Routing ii) Multicast Routing.	[8M]
	b)	What is multiple access control? Explain various protocols used to implement this.	[8M]
6	a)	Describe the architecture, MAC sub layer, addressing mechanisms of wireless LANs	[8M]
	b)	Write the physical layer specifications of fast Ethernet. How they are different from standard Ethernet.	[8M]
7	a)	Describe the operational model of HTTP protocol. Relate this with WWW and FTP.	[8M]
	b)	How to access information over a mobile through WAP? Explain its protocol design.	[8M]

MODEL QUESTION PAPER-1

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Year - I Semester Examinations

EMBEDDED SYSTEM DESIGN

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART -A **(25 Marks)**

1. a) Define Embedded System. [2]
   b) List out the differences between an embedded system and a general purpose Computer? [3]
   c) What is the role of ASIC in Embedded System design? [2]
   d) What is Actuator? [3]
   e) What are the types of communication interface? [2]
   f) Define Onboard communication interface with Example? [3]
   g) Define Assembly Level Language? [2]
   h) What is absolute object file? [3]
   i) What is an operating system? [2]
   j) Define kernel? [3]

PART -B **(50 Marks)**

Section-I

2. Define an embedded system? Explain the characteristics of Embedded Systems. [10]

Or

3. Explain the various purposes of embedded systems in detail with illustrative examples. [10]

Section-II

4. a) What are the different types of memories used in embedded system design? Explain each with examples. [05]
   b) Explain the role of sensors in embedded system design. [05]

Or

5. With a neat diagram, explain the architecture of a general purpose processor. [10]

Section –III

6. Explain the different communication interfaces with respect to embedded systems.[10]

Or

7. Explain in detailed about I2C and SPI communication interface. [10]

Section-IV

8. What is the need of an embedded firmware? Briefly explain the embedded firmware development languages. [10]

Or

9. Explain the various steps involved in the assembling of an assembly language program? [10]

Section-V

10. Explain in detail, the different task communication synchronization issues encountered in Inter Process communication. [10]

Or

11. Explain the architecture of device driver, with neat sketch and give the applications of device drivers. [10]

MODEL QUESTION PAPER-2

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Year - I Semester Examinations

EMBEDDED SYSTEM DESIGN

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART -A **(25 Marks)**

1.	a)	List the characteristics of an embedded system	[2]
	b)	What is the difference between a system and an embedded system?	[3]
	c)	Describe the components used as the core of an embedded system?	[2]
	d)	Give the difference between microprocessor and microcontroller?	[3]
	e)	What is inter process communication	[2]
	f)	Define Address Frame and Data Frame?	[3]
	g)	What is an Operating system? What are its primary functions?	[2]
	h)	Write the difference between compiler and cross compiler?	[3]
	i)	What is Remote Procedure Call and explain its working?	[2]
	j)	Discuss the issues in Task Synchronization briefly.	[3]

PART -B **(50 Marks)**

Section-I

2. Explain in detail the classification of embedded system. [10]

Or

3. a) Explain the major application areas of embedded systems.
   b) What are the components of Embedded System Hardware? [5+5]

Section-II

4. List out and Discuss in detail about the components of typical embedded systems. [10]

Or

5. Define digital signal processing (DSP)? Explain the role of DSP in embedded system design? [10]

Section –III

6. Explain in detail about Parallel Interface in onboard communication interface. [10]

Or

7. Discuss in detail about RS232 and RS485 interfaces. [10]

Section-IV

8. Determined the high level language based on embedded firmware development technique? [10]

Or

9. a) Write the advantages and limitations of high language based development?
   b) Write the advantages and drawbacks of assembly language based development? [5+5]

Section-V

10. Discuss in detail about the TASK and Process in the operating system. [10]

Or

11. Define kernel? What are the different functions handled by a general purpose kernel? [10]

MODEL QUESTION PAPER-3

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Year - I Semester Examinations

EMBEDDED SYSTEM DESIGN

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART -A **(25 Marks)**

1.	a)	Discuss the various embedded system requirements?	[2]
	b)	Give the applications of an embedded system?	[3]
	c)	Write the difference between PLD and ASIC?	[2]
	d)	Discuss the different types of RAM used for embedded system design?	[3]
	e)	Define UART	[2]
	f)	Difference between I2C and SPI	[3]
	g)	Write short notes on Linker and Locater?	[2]
	h)	Define embedded firmware?	[3]
	i)	Explain process life cycle?	[2]
	j)	Discuss how accurate time management is achieved in real time kernel?	[3]

PART -B **(50 Marks)**

Section-I

2. Explain in detail about design process of Embedded System. [10]

Or

3. Discuss in detail about different characteristics of embedded systems with related examples. [10]

Section-II

4. What is processor architecture? What is the different processor architectures available processor/controller design? Give an example [10]

Or

5. Define sensor? Explain its role in embedded system design? Illustrate with an example? [10]

Section –III

6. Explain in detail about USB communication interface. [10]

Or

7. Discuss in detail about infrared and Bluetooth. [10]

Section-IV

8. Discuss about source file to object file translation in the assembly language based development? [10]

Or

9. Explain about library file creation and usage in the assembly language based development? [10]

Section-V

10. What is task control block (TCB)? Explain the structure of the TCB. [10]

Or

11. List out the different types of non-preemptive scheduling algorithms? State the merits and demerits of each? [10]

MODEL QUESTION PAPER-4

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Year - I Semester Examinations

EMBEDDED SYSTEM DESIGN

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART -A **(25 Marks)**

1.	a)	Give examples for small scale embedded systems?	[2]
	b)	Explain the characteristics of embedded system?	[3]
	c)	Define is PPI device?	[2]
	d)	Define Relay? What are the different types of relays are available?	[3]
	e)	Write the merits and limitations of the RS232 interface?	[2]
	f)	Write the merits and limitations of the IEEE1394 interface over USB?	[3]
	g)	Distinguish between the assembly language and machine language?	[2]
	h)	Define the functionality of cross compiler conversion?	[3]
	i)	Define task scheduling?	[2]
	j)	Explain the different queues are associated with process scheduling?	[3]

PART -B **(50 Marks)**

Section-I

2. Describe in detailed about embedded cores? [10]

Or

3. Explain the real life example on the bonding of embedded technology with human life? [10]

Section-II

4. Define actuator? Explain its role in embedded system design? Illustrate with an example? [10]

Or

5. Discuss in detail about the functionality and role of Watch dog Timer in embedded system [10]

Section –III

6. Explain in detail about the RS 232 serial interface with pin configuration? [10]

Or

7. Explain the sequence of operation for communicating with an I2C slave device? [10]

Section-IV

8. Determined the high level language based on embedded firmware development technique? [10]

Or

9. Discuss about source file to object file translation in the assembly language based development? [10]

Section-V

10. Determine how multithreading can improve the performance of an application with an illustrative example? [10]

Or

11. Explain various activities involved in the creation of process and threads? [10]

MODEL QUESTION PAPER-5

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Year - I Semester Examinations

EMBEDDED SYSTEM DESIGN

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B

Part A is compulsory which carriers 25 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

PART -A **(25 Marks)**

1.	a)	Write the advantages of embedded system?	[2]
	b)	Define and give the examples for large scale embedded systems?	[3]
	c)	Define SRAM cell?	[2]
	d)	Describe the components used as the core of an embedded system?	[3]
	e)	Compare RS232 and RS485?	[2]
	f)	Define GSM	[3]
	g)	Define inline assembly?	[2]
	h)	Define super loop model design in embedded firmware design?	[3]
	i)	Write the different types of operating system?	[2]
	j)	Define task scheduling?	[3]

PART -B **(50 Marks)**

Section-I

2. Explain in detail about characteristics and applications of embedded systems. [10]

Or

3. Discuss about the product life cycle of an embedded product development? [10]

Section-II

4. Define RESET Circuit? Explain the role of RESET circuit in embedded. [10]

Or

5. Explain the functionality and role of Real Time Clock in embedded. [10]

Section –III

6. Explain in detail about different external communication interface? [10]

Or

7. Explain the sequence of operation for communicating with an I2C slave device? [10]

Section-IV

8. Explain about mixing assembly language with high level language [10]

Or

9. What is embedded firmware? What are the different approaches available for embedded firmware development? [10]

Section-V

10. Determined the different multitasking models in the operating system context? [10]

Or

11. Explain the different task communication synchronization issues encountered in inter process communication? [10]

R15

Code No: R15A0426

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
IV B. Tech I Semester Regular Examinations, November 2018
Digital Image Processing
(ECE)

Roll No										

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B
Part A is compulsory which carriers 25 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

****

PART-A (25 Marks)

1). a	Define neighbors of a pixel	**[2M]**
b	What is the need for image transform? Explain	**[3M]**
c	What is log transformation? How it is useful in image processing?	**[2M]**
d	Write the difference between image restoration and image enhancement	**[3M]**
e	List out various image enhancement techniques in spatial domain.	**[2M]**
f	Draw the model of Image degradation/Restoration process	**[3M]**
g	What is meant by image segmentation?	**[2M]**
h	Explain the effect of noise on edge detection	**[3M]**
i	What is image compression? Why it is needed? Explain	**[2M]**
j	Define interpixel and coding redundancy?	**[3M]**

PART-B (50 MARKS)

SECTION-I

2	What are the various fundamental steps in digital image processing? Explain	**[10M]**

OR

3	Discuss the properties of Walsh and Hadamard Transform	**[10M]**

SECTION-II

4	Differentiate spatial and frequency domain image enhancement techniques	**[10M]**

OR

5	Explain image smoothing using ideal lowpass filters and Butterworth low pass filters.	**[10M]**

SECTION-III

6(a)	Explain about image restoration using inverse filtering. Write the draw backs of this method.	**[5M]**
(b)	Discuss the minimum mean square error filtering	**[5M]**

OR

7	Describe constrained least square filtering technique for image restoration.	**[10M]**

SECTION-IV

8(a)	What is Hit-or-Miss transformation? Explain.	**[6M]**
(b)	Explain dilation and erosion operations.	**[4M]**

OR

9	Explain edge detection using gradient operator.	**[10M]**

SECTION-V

10	Discuss Huffman coding with an example.	**[10M]**

OR

11	Explain JPEG 2000 standards	**[10M]**

Code No: **RT41043** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1. a) Define the following terms:
   (i) Image (ii) Resolution (iii) Pixel and (iv) Digital Image [4]
   b) Compare Image Enhancement and Image Restoration. [4]
   c) Give the relation for degradation model for Continuous function. [3]
   d) Differentiate Pseudo color image processing and full color image processing. [4]
   e) What is the need for Compression? [4]
   f) What are the applications of Image segmentation? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Compute Haar Transform for following N Value. N=8. [8]
   b) Explain how Fourier transforms are useful in digital image processing and explain the properties of Fourier transform. [8]

3. a) Define Histogram of Image. Explain the concept of Histogram Equalization technique for Image enhancement. [8]
   b) Explain Spatial filtering in Image enhancement. [8]

4. a) Explain the need for Image restoration. [8]
   b) Explain the concept of Inverse Filtering and also mention the limitations of it. [8]

5. a) Explain about color segmentation process. [8]
   b) Discuss the procedure for conversion from RGB color model to HSI color model. [8]

6. a) Draw and explain the general image compression system model. [8]
   b) Write short notes on Image Pyramids and Sub band coding. [8]

7. a) Explain the significance of thresholding in image segmentation. [8]
   b) Write short notes on some basic morphology algorithms. [8]

Code No: **RT41043** **R13** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017

DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1.	a)	Define D_4 and D_8 distances.	[3]
	b)	What are the advantages of filtering in frequency domain?	[4]
	c)	How to estimate the degradation function by experimentation?	[4]
	d)	Define brightness, hue and saturation.	[3]
	e)	Write short notes on spatial redundancy.	[4]
	f)	Write short notes on morphological gradient.	[4]

PART–B *(3x16 = 48 Marks)*

2.	a)	What is meant by image interpolation? Discuss about various interpolation methods.	[8]
	b)	What is the need of image transform? List out various transform used in image processing.	[8]
3.	a)	With an example, explain the concept of histogram equalization.	[8]
	b)	State 2D sampling theorem and explain about aliasing in images.	[8]
4.	a)	Explain about noise reduction in an image using band reject and band pass filters.	[8]
	b)	Explain the concept of minimum mean square error filtering.	[8]
5.	a)	Explain about RGB color model and write its applications.	[8]
	b)	Describe about histogram processing in color images.	[8]
6.	a)	Draw the diagram of two band subband coding and decoding system, and explain it.	[8]
	b)	With an example, explain about arithmetic coding.	[8]
7.	a)	Discuss about opening and closing for gray scale images.	[8]
	b)	Explain the detection of isolated points in an image.	[8]

Code No: **RT41043** **R13** **Set No. 2**

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017

DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1.	a)	What is meant by spatial resolution and explain its significance.	[4]
	b)	Define Fourier spectrum and Phase angle of 2D-DFT.	[3]
	c)	Write short notes on Max and Min filters.	[4]
	d)	Write short notes on chromaticity and tristimulus values.	[4]
	e)	Explain about subjective fidelity criteria.	[3]
	f)	Explain the duality of erosion and dilation operations.	[4]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain the following terms: (i) Adjacency (ii) Connectivity (iii) Regions (iv) Boundaries	[8]
	b)	Obtain the Haar transformation matrix for N = 8.	[8]
3.	a)	Explain the use of histogram statistics for image enhancement.	[8]
	b)	Prove the validity of the discrete convolution theorem of two variables.	[8]
4.	a)	What is an adaptive median filter? Explain its use for noise reduction in an image.	[8]
	b)	With an example, explain the concept of image reconstruction from back projections.	[8]
5.	a)	Discuss about CMY and CMYK color models.	[8]
	b)	Discuss about noise in color images.	[8]
6.	a)	Explain the concept of wavelet packets and write its advantages.	[8]
	b)	Draw the functional block diagram of general image compression system and explain it.	[8]
7.	a)	Explain the following morphological algorithms: (i) Boundary extraction (ii) Hole filling	[8]
	b)	Define image gradient and explain its use in edge detection.	[8]

Code No: **RT41043** **R13** **Set No. 3**

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017

DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
*****

PART–A *(22 Marks)*

1. a) Compute the Haar transform of the 2 X 2 image $F = \begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix}$ [4]
   b) What is Log Transformation and write its use in image processing. [3]
   c) Write the expression for contraharmonic mean filter and explain its use in image restoration. [4]
   d) What is the purpose of color model and list out some color models. [4]
   e) What is image compression? Why it is needed? [4]
   f) List out different masks used to compute the gradient. [3]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the basic concepts of sampling and quantization in the generation of digital image. [8]
   b) Discuss about KL Transform and write its applications in image processing. [8]

3. a) Determine the convolution and correlation between the following images:
   $f(x,y) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$ and $g(x,y) = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ [8]
   b) Explain the following filters:
   (i) Band reject and Band pass filters (ii) Notch filters [8]

4. a) What are the different approaches to estimate the noise parameters in an image? Explain. [8]
   b) State and explain the Fourier-Slice Theorem. [8]

5. a) Discuss the concept of converting colors from RGB to HSI. [8]
   b) With necessary equations, explain about color edge detection. [8]

6. a) What are the various Multiresolution analysis requirements? Explain. [8]
   b) What is meant by block transform coding? Explain. [8]

7. a) Explain about morphological hit-or-miss transform. [8]
   b) Discuss about edge linking using local processing. [8]

Code No: **RT41043** **R13** **Set No. 4**

IV B.Tech I Semester Regular/Supplementary Examinations, October/November - 2017

DIGITAL IMAGE PROCESSING

(Common to Electronics and Computer Engineering, Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1.	a)	Define Walsh Transform and write its properties.	[4]
	b)	What is meant by gamma correction? Why it is needed?	[3]
	c)	Write the difference between image restoration and image enhancement.	[4]
	d)	Write short notes on RGB to CMY conversion.	[4]
	e)	Write the difference between Fourier transform and wavelet transform.	[4]
	f)	Explain the effect of noise in edge detection.	[3]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain about linear and nonlinear operations used in image processing.	[8]
	b)	State and Prove the translation and rotation properties of 2D-DFT.	[8]
3.	a)	Explain the concept of weighted average filter.	[8]
	b)	With necessary equations, explain the concept of homomorphic filtering.	[8]
4.	a)	List out some important noise probability density functions used in image processing and sketch their plots.	[8]
	b)	Discuss about Radon Transform and write its applications.	[8]
5.	a)	Explain about intensity slicing and write its applications.	[8]
	b)	Discuss about segmentation in RGB vector space.	[8]
6.	a)	Explain about wavelet transform in two dimensions.	[8]
	b)	Draw the block diagram of lossless predictive coding model and explain it.	[8]
7.	a)	Explain the following morphological operations: (i) Erosion (ii) Dilation	[8]
	b)	Explain the basics of intensity thresholding in image segmentation.	[8]

Code No: **RT41043** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, March - 2017

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1. a) Describe Weber ratio. [4]
   b) Illustrate first and second derivatives of a 1-D digital function representing a section of horizontal intensity profile from an image. [4]
   c) Explain about Arithmetic mean filter. [4]
   d) Discuss about Tonal correction. [4]
   e) Write a short note on Compression Ratio. [4]
   f) What is global, Local and dynamic or adaptive threshold? [2]

PART–B (3x16 = 48 Marks)

2. a) Explain Fast Fourier Transform (FFT) in detail. [8]
   b) Describe image formation in the eye with brightness adaptation and discrimination. [8]

3. a) What effect would setting to zero the half of lower-order bit planes have on the histogram of an image in general. [8]
   b) Discuss the limiting effect of repeatedly applying a 3x3 low-pass spatial filter to a digital image. You may ignore border effects. Is this effect different from applying 5x5 filter? [8]

4. a) What are the two approaches for blind image restoration? Explain in detail. [8]
   b) Explain about interactive image restoration. [8]

5. a) Briefly discuss about Complements on the color circle. [8]
   b) What is color image smoothing? Explain how smoothing will done by neighborhood averaging. [8]

6. a) Explain about the Fast Wavelet Transform. [12]
   b) Write a short note on Wavelet Packets. [4]

7. a) How can you control Over segmentation problem? Explain it. [8]
   b) Write short notes on Haar Transforms. [8]

Code No: **RT41043** **R13** **Set No. 1**

IV B.Tech I Semester Regular Examinations, November - 2016

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
****

PART–A *(22 Marks)*

1. a) Define neighbors of a pixel. [3]
   b) Write short notes on selective filtering. [4]
   c) Write the difference between image restoration and image enhancement. [4]
   d) What is the advantage of color in image processing applications? [4]
   e) What is meant by digital image water marking? [3]
   f) What is meant by image segmentation? Write its use in image processing. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the following mathematical operations on digital images
      i) Array versus Matrix operations ii) Linear versus Nonlinear Operations [8]
   b) Explain the following two properties of 2D-DFT:
      i) Convolution ii) Correlation [8]

3. a) What is meant by histogram specification? Explain. [8]
   b) Explain image smoothing using ideal lowpass filters and Butterworth lowpass filters. [8]

4. a) What are the advantages of adaptive filters? Explain about adaptive median filter. [8]
   b) Explain about image restoration using inverse filtering. Write the draw backs of this method. [8]

5. a) What is Pseudocolor image processing? Explain. [8]
   b) Explain about color image smoothing. [8]

6. a) Explain two-band subband coding and decoding system. [8]
   b) With an example, explain about run-length coding. [8]

7. a) What is Hit-or-Miss transformation? Explain. [8]
   b) Explain about edge detection using gradient operator. [8]

Code No: **RT41043** **R13** **Set No. 2**

IV B.Tech I Semester Regular Examinations, November - 2016

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1.	a)	What is the need for image transform? Explain.	[4]
	b)	What is meant by moiré patterns? Explain.	[4]
	c)	Draw the model of Image degradation/Restoration process.	[3]
	d)	What is the significance of color model?	[4]
	e)	Define subband coding?	[3]
	f)	Explain how a point can be detected in an image?	[4]

PART–B *(3x16 = 48 Marks)*

2.	a)	Explain the various basic relationships between pixels.	[8]
	b)	What is Haar Transform? Write the procedure to determine the Haar transformation matrix.	[8]
3.	a)	Explain the following operations: i) Contrast stretching ii) Bit-plane slicing	[8]
	b)	What is notch filter? Explain its use in image processing.	[8]
4.	a)	List out different noise probability density functions used in image processing applications.	[8]
	b)	With an example, explain how an image can be reconstructed from projections.	[8]
5.	a)	Explain about RGB color model?	[8]
	b)	Explain about histogram processing of color images.	[8]
6.	a)	What are the various requirements for multi-resolution analysis? Explain.	[8]
	b)	Draw the functional block diagram of image compression system and explain the purpose of each block.	[8]
7.	a)	Explain the following morphological algorithms i) Boundary extraction ii) Hole filling	[8]
	b)	What is meant by edge linking? Explain edge linking using local processing.	[8]

Code No: **RT41043** **R13** **Set No. 3**

IV B.Tech I Semester Regular Examinations, November - 2016

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1. a) What is meant by isopreference curves? Explain. [4]
   b) What is log transformation? How it is useful in image processing? [3]
   c) Explain about alpha-trimmed mean filter? [4]
   d) What is meant by pixel depth? Explain. [3]
   e) What is image compression? Why it is needed? Explain. [4]
   f) Explain the effect of noise on edge detection. [4]

PART–B *(3x16 = 48 Marks)*

2. a) What are the various fundamental steps in digital image processing? Explain. [8]
   b) Find the Haar transformation matrix for N = 8. [8]

3. a) Explain image sharpening using laplacian operator. [8]
   b) With necessary equations, explain about Homomorphic filtering. [8]

4. a) Explain how periodic noise can be reduced using frequency domain filtering. [8]
   b) What are the different ways to estimate the degradation function? Explain. [8]

5. a) Explain the procedure of converting colors from RGB to HSI. [8]
   b) Explain about color image sharpening. [8]

6. a) Discuss about wavelet transform in two dimensions. [8]
   b) What is block transform coding? Explain. [8]

7. a) Explain the following morphological algorithms [8]
      i) Thinning ii) Thickening
   b) Explain edge linking using Hough transform. [8]

Code No: **RT41043** **R13** **Set No. 4**

IV B.Tech I Semester Regular Examinations, November - 2016

DIGITAL IMAGE PROCESSING

(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering and Electronics & Computer Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B

*****

PART–A *(22 Marks)*

1. a) Explain about image acquisition using a circular sensor strip. [4]
   b) What are the advantages and disadvantages of local histogram processing when compared to global histogram processing. [4]
   c) What is meant by image restoration? [3]
   d) What is the purpose of color model? Explain. [3]
   e) Write the difference between wavelet transform and Fourier transform. [4]
   f) Prove that Erosion and dilation are duals of each other. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain about image sampling and Quantization. [8]
   b) Prove that both the 2-D continuous and discrete Fourier transforms are linear operations. [8]

3. a) Explain the concept of Unsharp masking and Highboost filtering. [8]
   b) Explain image sharpening using Butterworth highpass and Gaussian highpass filters. [8]

4. a) What are the different types of mean filters used for noise reduction? Explain. [8]
   b) Explain about image restoration using minimum mean square error filtering. [8]

5. a) Explain the procedure of converting colors from HSI to RGB. [8]
   b) Discuss about noise in color images. [8]

6. a) Compute the Haar transform of the 2 x 2 image [8]
   $$F = \begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix}$$
   b) With an example, explain Huffman coding. [8]

7. a) With necessary figures, explain the opening and closing operations. [8]
   b) Discuss about region based segmentation. [8]