



MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Sponsored by CMR Educational Society)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2008 Certified)
Maisammaguda, Dhulapally (Post Via Hakimpet), Secunderabad – 500100

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

MODEL QUESTION PAPERS

FOR

**II B.TECH II SEMESTER
(R-20)**

2022-2023

INDEX

S.NO	NAME OF THE SUBJECT
1	ANALOG AND DIGITAL COMMUNICATIONS
2	ANALOG CIRCUITS
3	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
4	PROBABILITY AND RANDOM PROCESSES
5	EMFW
6	DBMS



Model Paper-1

Time: 3 hours

Max. Marks: 70

Note: Paper consists of 5 Sections. Answer any one full question from each Section. Each question carries 14 marks and may have a, b, c, as sub Questions

SECTION-I

1. a. Define Modulation. Explain the need for modulation
b. Explain generation of AM using Switching Modulator

OR

2. a. Derive the time domain expression for SSB signal with only USB being transmitted
b. Explain Envelope Detection of VSB plus carrier.

SECTION-II

3. a. Derive the expression for single tone frequency modulated signal.
b. A 100 M Hz carrier is frequency modulated by a sinusoidal signal of amplitude 20V and frequency 100K Hz .The frequency sensitivity of the modulator is 25K Hz/volt. Determine i) frequency deviation ii) modulation index (β) iii) bandwidth.

OR

4. a. Explain about pre emphasis and de emphasis in FM systems.
b. Compare AM & FM.

SECTION-III

5. Explain the operation of High level AM Transmitter with a neat block diagram

OR

6. Explain the operation of Tuned Radio frequency Receiver using a neat block diagram and list its limitations

SECTION-IV

7. Explain the generation and demodulation of PAM.

OR

8. Explain DPCM transmitter & receiver with a neat block diagram & necessary equations.

SECTION-V

9. a. Explain the operation of DPSK transmitter and receiver.

- b. The bit stream 1011100011 is to be transmitted using DPSK. Determine the encoded sequence and transmitted phase sequence.

OR

10. Derive the expression for probability of error of Base band Receiver

Model Paper-2

Time: 3 hours

Max. Marks: 70

Note: Paper consists of 5 Sections. Answer any one full question from each Section. Each question carries 14 marks and may have a, b, c, as sub Questions

SECTION-I

- 1 a. Give the time domain and frequency domain expression for DSB-SC and draw its spectrum.
b. Explain the generation of DSB-SC using balanced modulator.

OR

- 2 a. Explain generation of SSB using phase shift method.
b. Compare all the Amplitude modulation techniques.

SECTION-II

- 3 Derive the expression for Narrow band frequency modulated signal. Draw its Phase representation and compare it with that of AM

OR

- 4 Explain the generation of FM using Armstrong method with a neat block diagram.

SECTION-III

- 5 Explain the operation of Low level AM Transmitter with a neat block diagram

OR

- 6 Explain the operation of Super Heterodyne Receiver using a neat block diagram

SECTION-IV

- 7 Explain the generation and demodulation of PWM.

OR

- 8 Explain DM transmitter & receiver with neat block diagrams & necessary equations.

SECTION-V

- 9 a. Explain detection of ASK using a coherent detector.
b. Explain detection of FSK using PLL.

OR

- 10 What is an optimum receiver? Derive its probability of error.

Model Paper-3

Time: 3 hours

Max. Marks: 70

Note: Paper consists of 5 Sections. Answer any one full question from each Section. Each question carries 14 marks and may have a, b, c, as sub Questions

SECTION-I

1. a. Derive the time domain and frequency domain expression for AM and draw its spectrum.
b. Explain the demodulation of AM using envelope detector

OR

2. a. Explain generation of SSB using Frequency discrimination method.
b. List the advantages and disadvantages of SSB.

SECTION-II

3. Explain how PM signal can be generated from FM signal. Justify with the necessary mathematics and draw the block diagram of the corresponding implementation

OR

4. Explain the generation of FM using Reactance modulator.

SECTION-III

5. Explain the operation of FM Transmitter with a neat block diagram

OR

6. Explain the operation of FM receiver using a neat block diagram.

SECTION-IV

7. Explain the generation and demodulation of PPM.

OR

8. a. Derive an expression for signal to quantization noise ratio of a PCM encoder using uniform quantizer when the input signal is uniformly distributed
b. What is companding? Explain the compression laws A-law and μ - law.

SECTION-V

9. Explain generation of BPSK signal and its coherent reception.

OR

10. Explain Eye Diagrams with neat diagram.

Model Paper-4

Time: 3 hours

Max. Marks: 70

Note: Paper consists of 5 Sections. Answer any one full question from each Section. Each question carries 14 marks and may have a, b, c, as sub Questions

SECTION-I

1. a. Derive necessary equations for Power relations in AM waves.
b. An AM transmitter radiates 50W power when carrier is modulated and $\mu=0.707$. Determine i) carrier power ii) modulation efficiency.

OR

2. Explain generation of VSB using Phase shift method.

SECTION-II

3. a. Explain the generation of NBFM.
b. Compare NBFM and WBFM

OR

4. Explain the detection of FM using Balanced Slope detector.

SECTION-III

5. a. Compare AM and FM Transmitters.
b. Define the terms sensitivity, selectivity and fidelity of a radio receiver
- OR**
6. Explain the different types of AGC.

SECTION-IV

7. Explain FDM using neat block diagram.

OR

8. a. Explain the Need for non-uniform quantization
b. Explain drawbacks of Delta Modulation

SECTION-V

9. Explain generation and detection of QPSK signal.

OR

10. Explain the optimum filter realization using correlator.

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

B.Tech II Year II Semester Examinations

(R20A0406) ANALOG AND DIGITAL COMMUNICATIONS

(Electronics and Communication Engineering)

Model Paper-5

Time: 3 hours

Max. Marks: 70

Note: Paper consists of 5 Sections. Answer any one full question from each Section. Each question carries 14 marks and may have a, b, c, as sub Questions

SECTION-I

1. Define Amplitude Modulation. Derive Single tone AM Equation. Draw the relevant waveforms in time domain and frequency domain
OR
2. Explain demodulation of DSB-SC using Coherent Detector with neat block diagram and necessary equations.

SECTION-II

3. a. Describe the generation of NBFM. Compare NBFM and AM
b. A 107.6MHz carrier signal is frequency modulated by a 7KHz sine wave. The resultant FM signal has frequency deviation of 50KHz, determine the following:
i) Carrier swing of FM signal
ii) Highest and Lowest frequencies attained by modulated signal
iii) Modulation index

OR

4. Define FM. Derive expression for Single tone FM. Draw the relevant waveforms

SECTION-III

5. Compare AM and FM Transmitters
OR
6. Compare AM and FM Receivers.

SECTION-IV

7. Explain the concept of Time Division Multiplexing using a neat block diagram.
OR
8. a. Derive an expression for signal to quantization noise ratio of a Delta Modulator
b. Explain operation of Adaptive DM transmitter and receiver.

SECTION-V

9. Explain the concept of QAM.
OR
10. Write short notes on (a) ISI (b) Eye Diagrams.

Code No: R20A0405

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Regular Examinations,
ANALOG CIRCUITS (ECE)

Time: 2 hours

Max. Marks: 70

**.....
SECTION-I**

- 1** Draw BJT CE amplifier and derive the expressions for mid frequency voltage gain A_{V_m} , low frequency voltage gain A_{V_l} and high frequency voltage gain A_{V_h} [14M]
(OR)
- 2** a) What is mean by multistage amplifiers? What is the need for multistage amplifiers? Illustrate block diagram representation of it. [7M]
b) Design a two-stage CE amplifier and then analyze it using exact model to find Voltage gain, current gain, input impedance and output impedance (both individual and overall). [7M]

SECTION-II

- 3** a) Draw the circuit diagram and explain the operation of two stage RC coupled amplifier. [7M]
b) Derive the expression for current gain in Darlington pair circuit with neat sketch? [7M]

(OR)

- 4** a) How are multi-stage amplifiers classified depending upon the type of coupling. [7M]
b) Write a note on distortions in amplifiers [7M]

SECTION-III

- 5** a) What is cross-over distortion? How to eliminate that? [4M]
b) What is mean by push-pull configuration? What are the different ways of implementing push-pull configuration? [5M]
c) Design Class-A Power amplifier and then derive the expression for its maximum efficiency. [7M]
(OR)
- 6** a) Draw and explain the operation of Complementary symmetry class B Push-pull amplifier. Also, derive the expression for its maximum conversion efficiency. [7M]
b) Why distortion is more concern in Power Amplifier than Voltage Amplifiers? Describe different distortions that may occur in Power Amplifiers. [7M]

SECTION-IV

- 7** a) Analyze the Collector-Coupled Monostable Multivibrator and then derive the expression of gate width. [7M]
 b) Draw the collector-coupled Bistable Multivibrator circuit diagram and then explain its operation with the help of the waveforms [7M]
- (OR)**
- 8** a) Sketch the output waveform of a Schmitt trigger circuit for sine wave input of 12V peak to peak if UTP =5V and LTP= 3V. [7M]
 b) Derive the equation for voltage-to-frequency converter when a stable multi vibrator is used as a basic circuit. [7M]

SECTION-V

- 9** a) Why the time - base generators are called sweep Circuits? Explain. [7M]
 b) Explain briefly the different methods of generating time-base Signal. [7M]
- (OR)**
- 10** a) Design a transistor Miller time-base generator circuit and then explain its operation. [7M]
 b) What is a linear time base generator? Draw a simple current sweep circuit and explain its working with the help of diagrams. [7M]

Code No: R20A0405**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Regular Examinations**ANALOG CIRCUITS****(ECE)****Roll No**

--	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. Draw Hybrid - π model for a transistor in the CE configuration [5M]
b. Derive the expression for the CE short circuit current gain at high frequencies [9M]
(OR)
- 2 a. Derive the expression for the CE current gain with resistive load at high frequencies [9M]
b. Derive the expressions for higher and lower cut-off frequency of a multistage amplifier [5M]

SECTION-II

- 3 a. Derive the expression for input resistance of a Darlington pair circuit. [7M]
b. Derive expressions for R_i , R_o , A_v & A_i using h-parameter model of a CC- CE amplifier? [7M]
(OR)
- 4 Differentiate between direct and capacitive coupling of multiple stages of amplifiers. With the help of a neat circuit diagram, describe the working of a cascade amplifier. [14M]

SECTION-III

5. Draw the push-pull class-B power amplifier and explain its operation. Show that the maximum conversion efficiency is 78.5%. [14M]
(OR)
6. a. What is meant by distortion in power amplifiers, explain the given different types of distortions [7+7=14M]
b. Draw and explain the circuit diagram of single tuned capacitive coupled amplifier with its operation in detail.

SECTION-IV

7. a. With the help of a neat diagram and waveforms, explain the principle of operation of monostable multivibrator. [10+4=14M]
b. Explain the transistor switching times with the help of a neat circuit diagram.

OR

8. a. Explain the working of Schmitt trigger with the help of a neat circuit diagram. [7+7=14M]
b. Draw and explain the circuit of Astable Multivibrator with necessary waveforms

SECTION-V

9. Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for sweep interval, T_s . [14M]
- OR**
10. a. With neat sketches and necessary expressions, explain the transistor Miller Time-base generator. [7+7=14M]
- b. Briefly describe various methods to achieve sweep linearity in time-base circuit.

ANALOG CIRCUITS MODEL PAPER III

R20

Code No: R20A0405

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Regular Examinations

ANALOG CIRCUITS

(ECE)

Roll No									

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. Derive the expressions for the following hybrid Π conductances [14M]
i) g_m ii) $g_{b'e}$ iii) $g_{b'c}$ iv) g_{ce} v) $g_{bb'}$
(OR)
- 2 a. Determine the hybrid $-\pi$ parameters of a Transistor operating at Collector Current $I_C(Q)=2\text{mA}$, $V_{CE}(Q)=20\text{V}$ and $I_B(Q)=20\mu\text{A}$. Transistor specifications are $\beta=100$, unity gain frequency $f_T=50\text{MHz}$, $C_O=3\text{pF}$, $h_{ie}=1.4\text{K}\Omega$, $h_{re}=2.5 \times 10^{-4}$, $h_{oe}=25\mu\text{mhos}$. Assume that the Operating temperature is 3000K. [10M]
- b. Explain Gain bandwidth product [4M]

SECTION-II

- 3a. How are multi-stage amplifiers classified depending upon the type of coupling.
- b. Write a note on distortions in amplifiers.
(OR)
- 4a. Discuss the effect of a coupling and by pass capacitors effects on CE amplifier. [5M]
- b. Draw the circuit diagram and equivalent circuit of an emitter follower amplifier and derive the expression for A_v , A_i and input impedance. [9M]

SECTION-III

5. a. Draw the circuit diagram of Direct coupled class-A power amplifier and explains its operation. Show that the maximum conversion efficiency is 25%. [7+7M]
- b. Derive an expression for bandwidth of an n-stage synchronously tuned amplifier.
(OR)
6. For a class B power amplifier driven from a 24V power supply and driving a load 8Ω load, compute
i) Input D.C power ii) output power iii) Conversion efficiency, if the peak to peak output voltage across the load resistance is 22V maximum [14M]

SECTION-IV

7. A self-biased binary uses n-p-n transistors have maximum values of $V_{CE}(\text{sat})=0.4\text{V}$ and $V_{BE}(\text{sat}) = 0.8\text{V}$ & $V_{BE\text{ cutoff}} = 0\text{V}$. The circuit parameters are $V_{cc} = 15\text{V}$, $R_C=1\text{K}\Omega$, $R_1=6\text{K}\Omega$, $R_2=15\text{K}\Omega$ AND $R_E=500\Omega$.
a) Find the stable-state currents and voltages.
b) Find the minimum value of h required for BJT to provide the above stable state values. [14M]

OR

- 8.a. Describe a bi-stable multivibrator. What do you mean by triggering? With the help of neat diagrams discuss the different methods of triggering a binary. [7M]
- b. Design a free running multivibrator to generate a square wave of amplitude 10V and frequency 1kHz with 70% duty cycle. Consider n-p-n transistors with $h_{fe}=25$, $V_{BE(sat)}=0.7V$, $V_{CE(sat)}=0.3V$, $I_{C(sat)}=5mA$. [7M]

SECTION-V

- 9.a Mention the different types of sweep circuit. With neat circuit and waveform explain the working principle of Miller Sweep circuit. [7+7=14M]
- b. Derive expression for sweep slope error (e_s), displacement error(e_d) and Transmission error (e_t).

OR

- 10.a. Design Miller's Sweep circuit for the following specifications: $V_{cc}=12V$, $i_c=1mA$, $h_{femin}=20$, $V_{CE(sat)}=0.3V$, $V_{BE(sat)}=0.7V$, assume sweep period $T_s=5$ msec. [7+7=14M]
Briefly describe various methods to achieve sweep linearity in time-base circuit.
- b. Draw the circuit of simple current time-base generator and explain its operation with the help of neat waveforms and necessary equations.

Code No: R20A0405**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester Regular Examinations**ANALOG CIRCUITS****(ECE)****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. a. Derive the expressions for the following hybrid Π conductances [14M]
i) g_m ii) $g_{b'e}$ iii) $g_{b'c}$ iv) g_{ce} v) $g_{bb'}$
(OR)
- 2a. Derive the expression for the CE current gain with resistive load at high frequencies [9M]
- b. Derive the expressions for higher and lower cut-off frequency of a multistage amplifier [5M]

SECTION-II

- 3a. Draw the circuit diagram and explain the operation of two stage RC coupled amplifier. [7M]
- b. Derive the expression for current gain in Darlington pair circuit with neat sketch? [7M]
(OR)
- 4a. Discuss the effect of a coupling and by pass capacitors effects on CE amplifier. [5M]
- b. Draw the circuit diagram and equivalent circuit of an emitter follower amplifier and derive the expression for A_v , A_i and input impedance. [9M]

SECTION-III

5. Draw the complimentary-symmetry class-B power amplifier and explain its operation. Show that the maximum conversion efficiency is 78.5%. [14M]
(OR)
- 6 a. What is a stagger tuned amplifier [6M]
b. Explain the effect of cascading single tuned amplifiers on Bandwidth [8M]

SECTION-IV

7. a With the help of a neat diagram and waveforms, explain the principle of operation of astable multivibrator. [10+4=14M]
- b Explain the transistor switching times with the help of a neat circuit diagram.

OR

- 8.a.** Explain the working of Schmitt trigger with the help of a neat circuit diagram.
- b.** Draw and explain the circuit of monostable Multivibrator with necessary waveforms. **[7+7=14M]**

SECTION-V

- 9.** Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for sweep interval, T_s . **[14M]**

OR

- 10 a.** With neat sketches and necessary expressions, explain the transistor Miller time-base generator. **[7+7=14M]**
- b.** Briefly describe various methods to achieve sweep linearity in time-base circuit.



Code No: R20A0405**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**
(Autonomous Institution – UGC, Govt. of India)
II B. Tech II Semester Regular Examinations
ANALOG CIRCUITS (ECE)**Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 Draw Hybrid - π model for a transistor in the CE configuration Derive the expression for the CE short circuit current gain at high frequencies. [14M]

OR

- 2 Describe the construction and operation of direct coupled amplifier. Draw the frequency response characteristics. List the advantages and disadvantages. [14M]

SECTION-II

- 3a. Derive the expression for input resistance of a Darlington pair circuit. [7M]
b. Derive expressions for R_i , R_o , A_v & A_i using h-parameter model of a CC- CE amplifier? [7M]

OR

- 4 Differentiate between direct and capacitive coupling of multiple stages of amplifiers. With the help of a neat circuit diagram, describe the working of a cascade amplifier. [14M]

SECTION-III

- 5a. What is a Power Amplifier? What are the classifications of power amplifier? [7M]
b. Draw the circuit diagram of Class A power amplifier and explain its operation. Derive the expression for power efficiency [7M]

OR

- 6 Draw the Complementary-Symmetry Class-B power amplifier and explain its operation. Find the maximum conversion efficiency. [14M]

SECTION-IV

- 7 How the transistor act as a “Switch”? Explain the switching times of transistor with the help of relevant figures. [14M]

OR

- 8 Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for slope error. [14M]

SECTION-V

- 9 Draw and explain the circuit of Bootstrap sweep generator. Derive an expression for sweep interval, T_s . [14M]

OR

- 10a. With neat sketches and necessary expressions, explain the transistor Miller time-base generator. [7M]
b. Briefly describe various methods to achieve sweep linearity in time-base circuit. [7M]

Code No: R20A0061

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Model Question Paper
Managerial Economics and Financial Analysis
(ECE)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Section-I

1. a) What is managerial economics? Discuss the nature & Scope of Managerial economics [7M]
- b) What is demand forecasting? Explain various factors involved in demand forecasting.[7M]

OR

2. a) Explain Law of Demand with its exceptions [7M]
- b) Distinguish between Micro and Macroeconomic concepts (7M)

Section-II

3. a) Define Production function. How can a producer find it useful? Illustrate. (7M)
- b) Define Cost. Explain the different cost concepts used in the process of Cost Analysis. (7M)

OR

4. a) Discuss about the economies and diseconomies of scale. (7M)
- b) Calculate the BEP in units and rupees using the following details: • Selling price per unit Rs. 100 • Variable cost per unit Rs. 60 • Fixed costs Rs. 20,000 • Actual sales Rs. 2,00,000 (7M)

Section-III

5. a) Define Market. Explain the structure of market with suitable examples. (7M)
- b) Define partnership. Explain its features and evaluate it against sole proprietorship. (7M)

OR

6. a) What is price? Explain different methods of Pricing. (7M)
- b) Explain the need for public enterprises in India. Do you think Public Enterprises as a whole have fulfilled that need? (7M)

Section-IV

7. a) What are the accounting concepts that govern accounting process? Explain in brief. (7M)

b) Explain the main sources have long term finance. (7M)

OR

8. a) Explain the factors affecting the requirements of working capital. (7M)

b) Explain about cash and capital budget. (7M)

Section-V

9. a) What is capital budgeting? Explain methods of capital budgeting? (7M)

b) What is ratio analysis? Explain different types of ratio analysis (7M)

OR

10. Ram Enterprise is considering purchasing a CNC machine. The following are the earnings after tax from the two alternative proposal under consideration each costing Rs 8, 00,000. Select the better proposal if the company wishes to operate @ 10% rate of return. (14M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Proposal I	80,000	2,40,000	3,20,000	4,80,000	3,20,000
Proposal 2	2,40,000	3,20,000	4,00,000	2,40,000	1,60,000
Present value of Rs 1 @10%	0.909	0.826	0.751	0.683	0.620

Code No: R20A0061

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Model Question Paper
Managerial Economics and Financial Analysis
(ECE)

Roll No									
---------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Section-I

1. (a) Define managerial economics. Illustrate how it helps in solving managerial problems and explain the nature. (7M)

(b) Explain different methods of demand forecasting (7M)

OR

2. (a) What are the different kinds of elasticity of demand that are relevant to the manager of a firm? (7M)

(b) How do you forecast demand for a new product? (7M)

Section-II

3. (a) Explain the concepts of cost and explain their contribution to managerial decisions. [7M]

(b) Explain production function. [7M]

OR

4. (a) Discuss about isoquants. [7M]

(b) What is meant by breakeven analysis? Explain its advantages. (7M)

Section-III

5(a) Explain the types of competition. [7M]

(b) What is perfect competition and explain its features. [7M]

OR

6.(a) Explain the state/public enterprises and their various forms. [7M]

(b) What is the importance of pricing in a business organization? [7M]

Section-IV

7(a) Write different types of shares [7M]

(b) Define Financial Accounting. Explain the importance and Limitations of Financial Accounting. (7M)

OR

8. (a) what is accounting? Explain the principles of accounting. (7M)

(b) write the format and importance of balance sheet. (7M)

Section-V

9.(a) Illustrate the advantages and Disadvantages of NPV Method. (7M)

(b) A firm is considering two projects each with an initial investment of Rs.20,000 and a life of 4 years. The following is the list of estimated cash inflows after taxes and depreciation. (7M)

year	Proposal I	Proposal II	Proposal III
1	12500	11750	13500
2	12500	12250	12500
3	12500	12500	12250
4	12500	13500	11750
total	50000	50000	50000

Predict Accounting Rate of Return on (i) Average Capital (ii) Original Capital Employed

OR

10(a) discuss different types of liquidity and activity ratios (7M)

(b) A Company has an estimated Life of 4 years and an investment opportunity costing Rs.2,50,000 with the following expected Net Cash flow After Taxes and Before Depreciation. (7M)

Years	Net cash flows (rs)	P.V. of Rs.1 @24% D.f
1	120000	0.806
2	90000	0.650
3	160000	0.524
4	30000	0.423

Calculate payback period and NPV using with 10% discounting factor

Code No: R20A0061**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY****(Autonomous Institution – UGC, Govt. of India)****II B.Tech II Semester Model Question Paper****Managerial Economics and Financial Analysis****(ECE)**

Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

Section-I

1.(a) Explain the influencing factors of the elasticity of demand. (7M)

(b) Define managerial economics and explain its areas (7M)

OR

2.(a) What is demand forecasting? Explain various factors involved in demand forecasting. (7M)

(b) What is elasticity of demand? And explain its types and measurement (7M)

Section-II

3.(a) Explain the importance production function and describe the salient features of Cobb-Douglas production function (7M)

(b) Describe the importance of Break-even analysis and Break-even point. (7M)

OR

4.(a) You are required to Determine i) P/V Ratio (ii) Break Even Point in Value (iii) Sales required to earn a profit of Rs.4,50,000 and (iv) Profit when Sales are Rs.21,60,000 from the following information (7M)

Fixed Expenditure Rs.90,000,

Variable Cost Per unit :

Direct material Rs.5

Direct labour Rs.2

Direct Overheads

100% of Direct

Labour Selling

price per unit

Rs.12/-

(b) The Sales Turnover and profit during two years were given as follows:

(7M)

Years	2003	2004
Sales (Rs.)	1,00,000	1,20,000
Profit (Rs.)	15,000	23,000

You are required to Compute the following: i) P/V Ratio ii) Fixed Cost iii) Break Even Point (Value) ii) Sales required to earn a profit of Rs.20,000 iii) Profit when Sales are Rs.1,25,000

Section-III

5.(a) define business. Explain its characteristics (7M)

(b) Explain the salient features of private limited and public limited companies (7M)

OR

6. (a) Describe the features of perfect competition.

(b) Make a comparison among Monopolistic, Monopoly and Oligopoly competition? (7M)

Section-IV

7.(a) Describe different types of capital. (7M)

(b) explain about different methods and sources of capital (7M)

OR

8.(a) Describe the advantages and disadvantages of double entry book keeping (7M)

(b) Prepare Trial Balance of Mr.Rajaram as on 31.12.2005 from the following balances:

- | | |
|-----------------------------|--------------------------------|
| 1. Sundry Debtors 32,000 | 9. Stock as on 1.1.2005 22,000 |
| 2. Cash in Hand 35 | 10. Cash at Bank 1,545 |
| 3. Plant & Machinery 17,500 | 11. Sundry Creditors 10,650 |
| 4. Trade expenses 1,075 | 12. Sales 2,34,500 |
| 5. Salaries 2,225 | 13. Carriage Outwards 400 |
| 6. Rent 900 | 14. Bills Payable 7,500 |
| 7. Purchases 2,18,870 | 15. Discount Allowed 1,100 |
| 8. Capital 79,500 | 16. Business Premises 34,500 |

Section-V

9.(a) Briefly explain the traditional methods of capital budgeting. (7M)

(b) Briefly describe the modern methods of capital budgeting. (7M)

OR

10. Define Ratio Analysis. Describe the advantages/significance and limitations of Ratio Analysis(14M)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Model Question Paper
Managerial Economics and Financial Analysis
(ECE)

Roll No							
---------	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14marks.

Section -I

Q. No. 1) Explain types of elasticity of demand ? (14M)

OR

Q. No. 2) Define Law of demand and write about its Exceptions? (14M)

Section -II

Q. No. 3) Define Production function? Explain about its Types? (14M)

OR

Q. No. 4) a) Explain any two types of costs with example (7M)

b) Determination of Break-Even Point (7M)

Section -III

Q. No. 5) Define market structure. and explain in detail about Features of Perfect competition (14M)

OR

Q. No. 6 a) Illustrate any four types of Pricing methods. (7M)

b) Explain Advantages and Disadvantages of Sole Proprietorship form of business organization? (7M)

Section -IV

Q. No. 7 a) Explain different sources of raising finance ? (7M)

b) Explain about influencing factors of Working Capital needed by an organization? (7M)

OR

Q. No. 8) Give a description of different Concepts and Conventions of Financial Accounting? (14M)

Section -V

Q. No. 9) A company is considering purchase of a new machine. Two alternatives have been given, each having initial cost of Rs 4,00,000. The annual cash flows at the end of each year for the next 4 years are as follows: (14M)

Year	Machine -A	Machine-B
	Rs	Rs
1	40,000	1,20,000
2	1,20,000	1,60,000
3	1,60,000	2,00,000
4	2,40,000	1,20,000

The company has a target return of 10% on its investment. Compare and suggest which one should opt for under NPV method.

OR

Q. No. 10 a) Describe about any two types of Capital Budget techniques? (4M)
b) Explain about any three Ratios? (4M)

Code No: R20A0408

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-1**Probability and Random Processes**

(ECE)

Roll No										
---------	--	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1(a)** Discuss about joint and conditional probability with relevant expressions. [7M]
(b) A pack contains 4 white and 2 green pencils, another pack contains 3 white and 5 green pencils. If one pencil is drawn from each pack, find the probability that
(i) Both are white
(ii) One is white another is green

OR

- 2(a)** Explain various types of events with necessary examples. [7M]
(b) A machine gun fires 3 sec at the rate of 2400 bullets/minute. The probability of hitting the target is 0.4. Estimate the probability of exactly 50 bullets hitting the target. [7M]

SECTION-II

- 3(a)** Describe with necessary expression about the properties of probability density function. [7M]
(b) A discrete random variable X takes values from 1 to 5 with probabilities given below. [7M]

X	1	2	3	4	5
P(X)	0.1	0.2	0.4	0.2	0.1

Compute the variance and skew of the random variable X

OR

- 4** Discuss about various standard distribution and density functions along with necessary expressions and graphical representation. [14M]

SECTION-III

- 5(a)** Verify the properties of joint characteristic function. [7M]
(b) Two random variables X and Y have the joint PDF

$$f_{XY}(x, y) = A e^{-(2x+y)}, \quad x, y \geq 0$$

$$0 \quad , \quad \text{otherwise}$$

Evaluate (i) A (ii) Marginal PDF $f_X(x), f_Y(y)$

OR

- 6(a)** Explain the joint conditional density function with relevant expressions. [6M]
(b) Two random variables X and Y have means $\bar{X} = 1$ and $\bar{Y} = 2$ variances $\sigma_X^2 = 4$ and $\sigma_Y^2 = 1$ and a correlation coefficient $\rho_{XY} = 0.4$. New random

variables W and V are defined by $V = -X + 2Y$, $W = X + 3Y$.

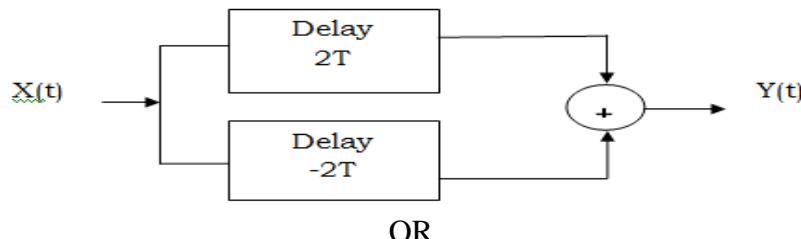
Deduce (i) The means (ii). The Variances (iii) The Correlations (iv) The correlation coefficient ρ_{VW} of V and W.

SECTION-IV

- 7(a)** Briefly introduce the concept of random process and categorize its classifications with examples. **[6M]**
- (b)** Discuss about stationarity and elaborate various types of stationarity **[8M]**
OR
- 8(a)** State and prove the properties of auto correlation function. **[8M]**
- (b)** A random process $X(t) = A \cos(\omega_0 t + \theta)$ where A, ω_0 are constants and θ is uniformly distributed random variable on the interval $(0, 2\pi)$. Check $X(t)$ is WSS or not **[6M]**

SECTION-V

- 9(a)** For a given random process $X(t)$ verify the following. **[9M]**
- (i) $S_{\dot{X}\dot{X}}(\omega) = \omega^2 S_{XX}(\omega)$ (ii) $S_{XX}(-\omega) = S_{XX}(\omega)$ where $\dot{X}(t) = \frac{d}{dt}(X(t))$
- (b)** The power density spectrum of a random process is given by $S_{XX}(\omega) = \frac{16}{16 + \omega^2}$. Analyze whether it is valid density or not. If it is transmitted through a system as shown in figure, find output Auto PSD. **[5M]**



- 10(a)** Develop the relationship between auto correlation and power spectral density. **[8M]**
- (b)** A stationary random process $X(t)$ with autocorrelation $R_{XX}(\tau) = ae^{-b|\tau|}$ then find power spectral density. **[6M]**

Code No: R20A0408

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-2**Probability and Random Processes**

(ECE)

Roll No									
---------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1(a)** Explain about various types of sets and operations on sets in detail [7M]
- (b)** In a box there are 100 resistors whose resistances and tolerances are as shown in the table below. Let A be the event of drawing a 47Ω resistor, B be the event of drawing a resistor with 5% tolerance, and C be the event of drawing a 100Ω resistor. Find $P(A/B)$, $P(A/C)$ and $P(B/C)$. [7M]

Resistance	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

OR

- 2(a)** Define relative frequency definition and classical definition of probability and also explain the axioms of probability. [7M]
- (b)** In a factory there are four machines. The machines produce 10%, 20%, 30%, 40% of an item respectively. The defective items produced by each machine are 5%, 4%, 3%, 2% respectively. Now an item is selected which is to be defective, what is the probability of it being from the second machine? [7M]

SECTION-II

- 3(a)** Define Probability Distribution function, state and prove its properties? [7M]
- (b)** A discrete random variable X takes values from 1 to 5 with probabilities given below. [7M]

X	1	2	3	4	5
P(X)	0.1	0.2	0.4	0.2	0.1

Compute the variance and skew of the random variable X

OR

4.a) Discuss about various standard distribution and density functions along with necessary expressions and graphical representation. [7M]

b) Find the probability that if tossing a fair coin 5 times then there will be appear [7M]
 a) 3 heads b) 3 tails and 2 heads c) at least 1 head d) not more than one tail

SECTION-III

5(a) Define and state the properties of joint density function and joint Distribution [7M]
 function.

(b) The joint density function of random variables X and Y is [7M]

$$f_{X,Y}(x,y) = 4xye^{-(x^2+y^2)}u(x)u(y)$$

 Find $f(y/x)$ and $f(x/y)$

OR

6(a) Explain statistical independence of the random variables. [6M]

(b) The joint probability density function is $f_{x,y}(x,y) = \begin{cases} \frac{1}{24} & 0 < x < 6, 0 < \\ & y < 4 \\ 0 & \text{else where} \end{cases}$ [8M]

Find the expected value of the function $g(X,Y) = (XY)^2$

SECTION-IV

7(a) Differentiate random variable and random process.. [6M]

(b) A random process $Y(t)$ is given as $Y(t)=X(t)\cos(\omega t+\Theta)$, where $X(t)$ is a wide [8M]
 sense stationary random process , ω is constant and Θ is random variable
 independent on $X(t)$,uniformly distributed on $(-\pi,\pi)$. Find a) $E[Y(t)]$ b) $R_{YY}(\tau)$.

OR

8(a) Define LTI system and derive the expression for following for the response of [8M]
 LTI system.

a) Mean b) Auto correlation function c) Cross correlation function

(b) A random process $Y(t)=X(t)-X(t+\tau)$ where $X(t)$ is at least WSS. [6M]

a) Show that the mean value of $Y(t)$ is zero even if $X(t)$ has a non-zero mean
 value.

b) Show that $\sigma_Y^2 = 2[R_{XX}(0) - R_{XX}(\tau)]$
 c) If $Y(t)=X(t)+X(t+\tau)$, find $E[Y(t)]$ and σ_Y^2

SECTION-V

9(a) Define power spectral density and state and prove its properties. [9M]

(b) A random process $Y(t)$ has the power spectral density $S_{YY}(\omega) = \frac{9}{\omega^2+64}$ [5M]

Find the Auto correlation function of Y(t).

OR

10(a) Derive the cross PSD between input and output of an LTI system

[8M]

(b) Find the PSD of WSS random process X(t) whose auto correlation function is

$$R_{XX}(\tau) = ae^{-b|\tau|}$$

[6M]

Code No: R20A0408

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Model Paper-3**Probability and Random Processes**

(ECE)

Roll No										
---------	--	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1(a)** Explain Joint and Conditional probabilities. [7M]
(b) An ordinary 52-card deck is thoroughly shuffled and 4 cards are drawn then what is the probability that all 4 cards are sevens?

OR

- 2(a)** Show that $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ and also derive it for Mutually Exclusive events.
(b) From a pack of 52 cards define A as “Drawing a king card”, event B as “drawing a jack or queen card”, event C as “Drawing a heart card”. Then find which statistically independent and dependent events are.

SECTION-II

- 3(a)** Explain the operations expected value and variance of single random variable in detail.
(b) The mean & variance of Binomial Distribution are 6 & 2.4 respectively. Find $p\{X>2\}$

OR

- 4.a)** Define characteristic Function and state and prove its properties. [7M]
b) Find Mean, Variance, Moment Generating function and characteristic function of exponentially distributed Random variable.

SECTION-III

- 5(a)** State and prove the density function of sum of two random variables. [7M]
(b) Two random variables X and Y have the joint pdf is [7M]

$$f_{x,y}(x,y) = \begin{cases} Ae^{-(2x+y)} & x,y \geq 0 \\ 0 & \text{elsewhere} \end{cases}$$

- i) Evaluate A
- ii) Find the marginal pdf's.
- iii) Find conditional density functions.
- iv) Find joint distribution function.

OR

- 6(a)** State and prove the properties of joint characteristic function. [6M]
- (b)** 1. Two random variables X and Y have means $\bar{X} = 1$ and $\bar{Y} = 2$ variances $\sigma_X^2 = 4$ and $\sigma_Y^2 = 1$ and a correlation coefficient $\rho_{XY} = 0.4$. New random variables W and V are defined by $V = -X + 2Y$, $W = X + 3Y$. Deduce (i) The means (ii). The Variances (iii) The Correlations (iv) The correlation coefficient ρ_{VW} of V and W. [8M]

SECTION-IV

- 7(a)** Explain Ergodicity of the random process in detail. [6M]
- (b)** A random process $X(t)$ is defined as $X(t) = A \cos(\omega_0 t + \theta)$ where A, ω_0 are constants and θ is uniformly distributed random variable on the interval $(0, 2\pi)$. Check $X(t)$ is WSS or not and also find average power of the random process $X(t)$. [8M]

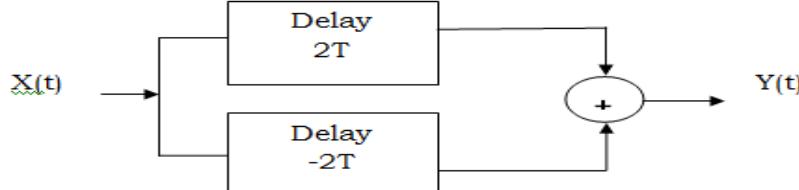
OR

- 8(a)** State and explain the properties of auto correlation function & cross correlation function. [8M]
- (b)** Statistically independent zero mean random process $X(t)$ and $Y(t)$ have auto correlation functions $R_{XX}(\tau) = e^{-|\tau|}$ and $R_{YY}(\tau) = \cos 2\pi\tau$ [6M]
 - a) Find the auto correlation function of the sum $W_1(t) = X(t) + Y(t)$
 - b) Find the auto correlation function of the difference $W_2(t) = X(t) - Y(t)$
 - c) Find the cross correlation function of $W_1(t)$ and $W_2(t)$.

SECTION-V

- 9(a)** Define cross power spectral density and state and prove its properties. [9M]

- (b)** The power density spectrum of a random process is given by $S_{xx}(\omega) = \frac{16}{16 + \omega^2}$. [5M]
Analyze whether it is valid density or not. If it is transmitted through a system as shown in figure, find output Auto PSD.



OR

10(a) Derive the relation between input PSD and output PSD of an LTI system [8M]
(or Derive the PSD of response of LTI system)

(b) Find the cross power spectral density for a) $R_{XY}(\tau) = \frac{A^2}{2} \sin(\omega_0 \tau)$ [6M]
b) $R_{XY}(\tau) = \frac{A^2}{2} \cos(\omega_0 \tau)$

Code No: R17A0403

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

II B.Tech I Semester Supplementary Examinations, May 2019
Probability Theory and Stochastic Process
(ECE)

Roll No									
---------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a). State and Prove the Bays theorem. [7M]
 b). Define Random Variable? What are the functions to be a Random Variable. Explain the different types of Random Variables. [7M]
- OR
- 2 a) if two dice are thrown randomly find the probability that [10M]
 (i) sum of two numbers is greater than 10
 (ii) Sum is between 2 and 5
 (iii)Sum greater than or equal to 7
- b). An experiment consists of rolling a die and flipping a coin. Let the random variable be a function X chosen such that (1) a coin head (H) outcome corresponds to positive values of X that are equal to the numbers that show up on the die and (2) a coin tail (T) outcome corresponds to negative values of X that are equal in magnitude to twice the number that shows on the die. Draw the corresponding sample space and show the mapping of X on to the real axis. [4M]

SECTION-II

- 3 a) List and explain properties of conditional distribution. [7M]
 b) Define central moment, variance and skew [7M]
- OR
- 4 a) Define characteristic function and moment generating function [7M]
 b) Define Probability distribution function and state its properties. [7M]

SECTION-III

- 5 a) Show that the characteristic function and probability density function of a random variable forms a Fourier transform pair. State the central limit theorem [7M]
 b) Two complex random variables are defined as $Z_1 = X_1 + jY_1$ and $Z_2 = X_2 + jY_2$
 i. Find the covariance between Z_1 and Z_2 [7M]
 ii. State the conditions when Z_1 and Z_2 are statistically

OR

- 6 a). Given the function [7M]
- $$f_{X,Y}(x,y) = \begin{cases} b(x+y)^2, & -2 < x < 2 \text{ and } -3 < y < 3 \\ 0, & \text{elsewhere} \end{cases}$$
- (i) Find the constant b such that this is a valid joint density function [7M]
 (ii) Determine the marginal density functions.
 b). Illustrate the procedure to calculate probability density function of sum of two random variables X and Y

SECTION-IV

- 7 a).Explain the following [7M]
 i) Stationarity ii) Ergodicity iii) Statistical independence with respect to random processes
 b).A random process is given as $X(t) = At$, where A is a uniformly distributed random variable on (0,2). Find whether $X(t)$ is wide sense stationary or not [7M]
 OR
- 8 a).Define autocorrelation function of a random process and write its properties .prove two of them. [7M]
 b). Given auto correlation function of a stationary ergodic process with no periodic components is $R_{XX}(\tau) = 25 + \frac{4}{1+5\tau^2}$ Find Mean and Variance of Process $X(t)$. [7M]

SECTION-V

- 9 a).Derive the relation between PSDs of input and output random process of an LTI system [7M]
 b). If $X(t)$ and $Y(t)$ are uncorrelated random processes, then find the power spectral density of $Z(t)$ if $Z(t) = X(t) + Y(t)$. Also find cross spectral density $S_{XY}(w)$. [7M]
 OR
- 10 a). If $Y(t) = A\cos(\omega_0 t + \theta) + N(t)$, where ' θ ' is a uniform random variable over $(-\pi, \pi)$, and $N(t)$ is a band limited Gaussian white noise process with PSD=K/2. If ' θ ' and $N(t)$ are independent, find the PSD of $Y(t)$. [7M]
 b). Derive the expression for the Cross Spectral Density of the input Process $X(t)$ and the output process $Y(t)$ of an LTI system in terms of its Transfer function [7M]

Code No: R17A0403

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech I Semester Regular Examinations, November 2018
probability Theory and Stochastic Process
(ECE)

Roll No									
---------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a). Define probability, set and sample spaces and random variables. [7M]
b).state and prove the total probability theorem. [7M]

OR

- 2 a). In a box there are 100 resistors whose resistances and tolerances are as shown in the table below. Let A be the event of drawing a 47Ω resistor, B be the event of drawing a resistor with 5% tolerance, and C be the event of drawing a 100Ω resistor. Find $P(A/B)$, $P(A/C)$ and $P(B/C)$. [10M]

Resistance	Tolerance		
	5%	10%	Total
22	10	14	24
47	28	16	44
100	24	8	32
Total	62	38	100

[4M]

- b). Discuss the relative frequency approach and axiomatic approach of probability

SECTION-II

- 3 a). Find mean and variance of unifurom distribution function . [7M]
b). The exponential density function given by $f_x(x) = \frac{1}{b} e^{\frac{-(x-a)}{b}}$ for $x > a$
 $= 0$ for $x < a$

Find out variance and coefficient of skewness.

[7M]

OR

- 4 a).Define probality density function and prove its properties [7M]
b) State and prove the any four properties of Moment generating function and Characteristic Function. [7M]

SECTION-III

- 5 a)The joint density function of random variables X and Y is [7M]
 $f_{XY}(x,y) = 8xy, 0 < x < 1, 0 < y < x$. Find the conditional density functions $f(x/y)$ and $f(y/x)$.
b) Explain joint moments of two random variables. [7M]

OR

- 6** a) Two statistically independent random variables X and Y have mean values $E[X] = 2$ and $E[Y] = 4$. They have second moments $E[X^2] = 8$ and $E[Y^2] = 25$. Find Variance of $W = 3X - Y$ [7M]
- b). A discrete random variable X with pdf is given by
- | | | | | | |
|------|-----|------|-----|------|-----|
| X | 0 | 1 | 2 | 3 | 4 |
| P(x) | 0.2 | 0.15 | 0.3 | 0.15 | 0.2 |
- Find the density function of Y for the transformation $Y = 3X^3 - 3X^2 + 2$ [7M]
- SECTION-IV**
- 7** a) With suitable example and mathematical equations, illustrate the difference between a wide-sense stationary and strict-sense stationary stochastic process. [7M]
- b) A random process $Y(t) = X(t) - X(t+\tau)$ is defined in terms of a process X(t). That is at least wide sense stationary. Show that mean value of Y(t) is 0 even if X(t) has a non Zero mean value. [7M]
- OR
- 8** a). Define cross correlation function of a random process and state and prove its properties [7M]
- b) A random process is defined as $X(t) = ACos(\omega_0 t + \theta)$, where θ is a uniformly distributed random variable in the interval $(0, 2\pi)$. Check for its wide sense stationarity? A and ω_0 are constants. [7M]
- SECTION-V**
- 9** a) If the auto correlation function of a process is $R(\tau) = k e^{-|\tau|}$, show that its spectral density is given by $s(w) = \frac{2}{1 + \left(\frac{w}{k}\right)^2}$ [7M]
- b. Discuss properties of cross power density spectrum [7M]
- OR
- 10** a). Discuss the relation between power spectrum and auto correlation function [7M]
- b). Derive the relation between input PSD and output PSD of an LTI system [7M]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****B.Tech II year – II Semester Examinations****Model Paper-1****ELECTROMAGNETIC WAVES AND TRANSMISSION LINES****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. a. State and Prove Gauss's Law. [7]
 - b. Let $\bar{J} = 400 \sin\theta / (r^2 + 4)$ a_r A/m². Find the total current flowing through that portion of the spherical surface $r=0.8$ bounded by $0.1\pi < \theta < 0.3\pi$, $0 < \Phi < 2\pi$. [7]
- OR**
2. a. Show That $\bar{J} = \rho \bar{v}_d$ [7]
 - b. Given The Flux density $D = 16/r \cos(2\theta) \bar{a}_\theta$ C/m², Find the total charge within the region $1 < r < 2$ m, $1 < \theta < 2\text{rad}$, $1 < \Phi < 2\pi$ [7]

SECTION-II

3. a. State The Law required to calculate magnetic flux density or magnetic field intensity for a given current or current distribution and derive the expression for the same. [7]
 - b. Derive the conditions at boundary surface of Dielectric-Dielectric interface? [7]
- OR**
4. a. Define and Explain Ampere's circuit Law. [7]
 - b. State Maxwell's Equations in Differential and Integral form with clear statement. [7]

SECTION-III

5. a. Derive the equation for uniform plane wave in terms of H. [7]
- b. A 100MHz uniform plane wave Propagates in a lossless medium for which $\epsilon_r = 5$ and $\mu_r = 1$ find $v_p, \beta, \lambda, E_s, H_s$. [7]

OR

6. a. State and Prove the Poynting Theorem. [7]
- b. Write short Notes on [7]
 - i) Total internal reflection ii) Brewster Angle

SECTION-IV

7. a. Derive The Expression for Transmission Line Equation. [7]
- b. Given $R = 10.4 \Omega/\text{mt}$

$$\begin{aligned}L &= 0.00367 \text{ H/mt} \\G &= 0.8 \times 10^{-4} \text{ mhos/mt} \\C &= 0.00835 \mu\text{F/mt.}\end{aligned}$$

Calculate Z_0 and γ at 1.0 KHz.

[7]

OR

8. a) Derive the expression for α and β in terms of primary constants of a line [7]
b) Explain transmission line parameters in detail. [7]

SECTION-V

9. a) Establish the relations for Z_{sc} and Z_{oc} of rf lines and sketch their variation with βl . [7]
b) A 60ohm lossless line is 30m long and is terminated with a load of $75+j50\text{ohms}$ at 3MHz
find its reflection coefficient, VSWR, if the line velocity is 60% of the velocity of light [7]

OR

10. a) Explain the principle of single stub matching. [7]
b) Calculate the skin depth for the following conditions. [7]
Copper $f=10^{10}\text{Hz}$, $\mu=\mu_0$, $\sigma=5.8 \times 10^7 \text{s/m}$

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****B.Tech II year – II Semester Examinations****Model Paper-II****ELECTROMAGNETIC WAVES AND TRANSMISSION LINES****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

1. a. State and explain coulomb's law? [7]
- b. Find the force on a charge of -100mC located at $P(2,0,5)$ in free space due to another Charge of $300\mu\text{C}$ located at $Q(1,2,3)$. [7]

OR

2. a. State and Prove Laplace's and Poissson's Equation Starting from Gauss's Law [7]
- b. The potential field $V=2x^2yz-y^3z$ exists in a dielectric medium having $\epsilon=2\epsilon_0$ calculate the total charge within the unit cube $0 < x < 1\text{m}, 0 < y < 1, 0 < z < 1\text{m}$. [7]

SECTION-II

3. a. Define Ampere's Circuit Law in point and integral forms for Static fields. [7]
- b. Establish the fields in the different regions of a coaxial cable carrying a current I , and sketch their variation with radial distance. [7]

OR

4. a. State and Explain Biot-Savart's law. [7]
- b. A Potential field is given by $V=15(x^2-y^2)$.The point $p(4,-2,1)$ lies on the boundary of the conductor and free space At P, obtain the magnitudes of i)V ii) E iii)D [7]

SECTION-III

- 5.a. Derive The attenuation and phase constant in conducting medium [7]
- b. A Sinusoidal varying EM wave in a medium of $\epsilon_r=1 \mu_r=1$ is transmitting power at a density 1.2watts/m^2 .Find the maximum values of E and H fields. [7]

OR

- 6.a. Derive Expression for reflection and transmission coefficients of an EM wave when it is Incident normally on a dielectric. [7]

- b. A perpendicularly polarized wave is incident at an angle of $\theta_i=15$ degrees. It is propagating from medium1 to medium2 .medium 1 is defined by $\epsilon_{r1}=8.5, \mu_{r1}=1, \sigma_1=0$ and medium 2 is free space if $E_i=1\text{ mV/m}$, determine E_r, H_i, H_r . [7]

SECTION-IV

7. a. Derive the Condition for Distortionless Transmission Line. [7]
b. Measurements on a Transmission Line of length 120Km were made at frequency of 6000Hz.If $Z_{OC}=520(-30\text{deg})$ and $Z_{SC}=640(43\text{deg})$ find Z_o and P . [7]

OR

8. a.Explain the conditions which are used for minimum attenuation in transmission line [7]
b. The propagation constant of a lossy transmission line is $1+j2 \text{ m}^{-1}$ and its characteristic impedance is $20+j0\Omega$ at $\omega= 1\text{ rad/s}$. Find R,C,L,G for the Line. [7]

SECTION-V

9. a. Derive the relation between reflection coefficient and characteristic impedance [7]
b. Write short notes on smith chart. [7]

OR

10. A transmission line of length 0.40λ has a characteristic impedance of 100Ω and is terminated in a load impedance of $200 + j180\omega$. Find the
(i) Voltage reflection coefficient
(ii) Voltage standing wave ratio
(iii) Input impedance of the line. [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****B.Tech II year – II Semester Examinations****Model Paper-III****ELECTROMAGNETIC WAVES AND TRANSMISSION LINES****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

1. a. Define Line charge Density? Derive the infinite line Electric field $E=\rho L/2\pi\epsilon_0 a_p$ [7]

b. Find E at(2,0,2) if a line charge of 10PC/m lies along the y-axis [7]

OR

2. a. Define Capacitance and obtain the parallel plate capacitance

b. A parallel plate capacitance has 500mm side plates of square shape separated by 10mm distance A sulphur slab of 6mm plates with $\epsilon_r=4$ kept is on the lower plate find the capacitance of the set up If a voltage of 100V is applied across the capacitor calculate the voltages at both the regions of the capacitor between the plates. [7]

SECTION-II

3. Derive an expression for magnetic field strength,H,due to a finite filamentary conductor carrying a current I and placed along Z-axis at a point 'P' on Y-axis.Hence deduce the magnetic field strength for the length of the conductor extending $-\infty$ to $+\infty$. [14]

OR

4. a.Explain the inconsistency of Ampere's circutal Law [7]

b.A certain material has $\sigma=0$ and $\epsilon_r=1$ if $H=4\sin(10^6t-0.01z)\bar{a}_y$ A/m.Make use of Maxwell's equations to find μ_r . [7]

SECTION-III

5. a. Derive the relation between E and H for a uniform plane wave in dielectric medium. [10]

b. Explain polarization of uniform plane wave. [4]

OR

6.a. Define Polyting's theorem and Polyting Vector. [7]

b.Explain wave propagation in good dielectric medium. [7]

SECTION-IV

7. a) Explain the conditions which are used for minimum attenuation in transmission lines [7]
b) Derive the secondary conditions for loss less transmission line. [7]

OR

8. Show that for an uniform transmission line the following relations are valid
a) $Z_0 = \sqrt{Z_{oc} \cdot Z_{sc}}$ [7]
b) $\text{Tanh} \frac{pl}{\lambda} = \sqrt{\frac{Z_{sc}}{Z_{oc}}}$ [7]

SECTION-V

- 9.a. Derive the expression for the input impedance of a transmission line of length L. [10]
b. List out the applications and losses of transmission lines [4]

OR

10. Describe the construction of smith chart and give its applications. [14]

MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING****B.Tech II year – II Semester Examinations****Model Paper-IV****ELECTROMAGNETIC WAVES AND TRANSMISSION LINES****Time: 3 hours****Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

1. a .Define and Derive the relation between E and V. [7]
- b. Prove the poisson's equation for Electrostatic field. [7]

OR

2. a.Distinguish between the conduction and convention currents. Calculate the relaxation time for brass material, having Conductivity of 1.1×10^7 mho/m at 10MHz. [7]
- b.Find the capacitance of a 50cm.long coaxial cable, having conductors of 4cm and 2cm diameters, separated by a medium of a relative permittivity 2.56. [7]

SECTION-II

- 3.a.Define Inductance? Derive the toroid inductance [7]
- b.A toroid has air core and has a cross-sectional area of 10mm^2 .It has 1000turns and its mean radius is 10mm.Find its Inductance [7]

OR

- 4.a. Obtain the integral form of Maxwell's equation for time varying fields. [7]
- b. In a medium of $\mu_r=2$, find E,B and displacement current density if $H=25\sin(2\pi 10^8 t+6x)a_y$ mA/m [7]

SECTION-III

5. a. For good dielectrics derive the expressions for α, β, γ and η . [7]
- b. A plane wave travelling in a medium of $\epsilon_r=1, \mu_r=1$ has an electric field intensity of $100x\sqrt{\pi}\text{V/m}$.Determine the energy density in the magnetic field and also the total energy density. [7]

OR

6. a Derive Expression for reflection and transmission coefficients of an EM wave. [7]
- b. A perpendicularly polarized wave is incident at an angle of $\theta_i=15^\circ$ degrees. It is free propagating from medium1 to medium2 .medium 1 is defined by $\epsilon_{r1}=8.5, \mu_{r1}=1, \sigma_1=0$ and medium2 space if $E_i=1\text{mV/m}$, determine E_r, H_i, H_r . [7]

SECTION-IV

7.a.Derive the attenuation constant and phase constant in terms of primary constants [7]

b.Explain different types of loading for transmission lines. [7]

OR

8.a.Derive the characteristic impedance of a transmission line in terms of its line constants[7]

b.At 8MHz the characteristic impedance of a transmission line as $40-j2\text{ohms}$ and the propagation constant $0.01+j0.18$ per meter.Find the primary constant. [7]

SECTION-V

9. a. Explain the principal of single stub matching [7]

b. Write Short notes on Smith Chart [7]

OR

10. a. Derive the relation between reflection coefficient and characteristic impedance

b. write short notes on smith chart. [7+7]

**MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

B.Tech II year – II Semester Examinations

Model Paper-V

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

Time: 3 hours

Max. Marks: 70

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks

SECTION-I

- 1.a. State and prove Continuity equation. [7]
 - b. Three point charges $Q_1=0.5\text{nC}$, $Q_2=0.4\text{nC}$, $Q_3=-0.6\text{nC}$ are located in free space at $(0,0)$, $(3,0)$ and $(0,4)$ respectively. Determine the potential, electric field intensity and flux density at $(3,4)$. [7]
- OR**
2. a. Determine the amount of work necessary to assemble three point charges Q_1 , Q_2 , Q_3 in an empty space. Extend your result to n-point charges. [7]
 - b. Show that $\bar{J} = \rho \bar{v}_d$. [7]

SECTION-II

3. a. State and Prove the Ampere's Force Law. [7]
 - b. A toroidal ring has 200 turns. The outer diameter of the ring is 15cm with the inner diameter of 12cm. Find the flux density if the current is 8A. [7]
- OR**
4. a. State and explain boundary conditions between two dielectric media.
 - b. A circular loop conductor having radius of 0.2m is placed in XY plane. The loop consists of a resistance of 10ohms. If the Magnetic field is $B=\sin 10^4 t$ Tesla, find the current flowing in the loop. [7]

SECTION-III

5. a. Explain properties of uniform plane wave..
b. Derive the wave equation in dielectric medium. [7+7]

OR

- 6.a. Derive the equation for uniform plane wave in free space condition. [7+7]
- b. The electric field in free space is given by $E=50\cos(10^8t+\beta x)a_y\text{V/m}$. Find the direction of wave propagation. Calculate β and time it takes to travel a distance of $\lambda/2$.

SECTION-IV

7. Derive the equation for input impedance of the Eighth-Wave($\lambda/8$) line? Explain its significance.
[14]

OR

8. Write Short notes on
i) Smith Chart
ii) Single stub matching [14]

SECTION-V

- 9.a. Derive an expression for the propagation constant and characteristic impedance of Transmission line with R, L,C, G.
b. A telephone line has $R=30\Omega/\text{km}$, $L=100\text{mH}/\text{km}$, $G=0$, $C=20\mu\text{F}/\text{km}$.
At $f=1\text{KHz}$, obtain i) Z_0 ii) propagation constant iii) phase velocity. [7+7]

OR

- 10.a. Derive an expression for the input impedance of a lossless line of length 'l' in Terms of Z_0, β, Z_L and l when terminated by a load Z_L .
b. A lossless transmission line length 'l' with $Z_0=50$ is terminated by a load of $Z_L=50+j50$.Determine the reflection coefficient " R_r " and the standing wave Ratio. [7+7]

Code No: R18A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2021**Electromagnetic Fields & Waves****(ECE)**

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 2 hours 30 min**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1 a) Derive an expression for electric field intensity due to an infinite line charge. [7M]
 b) Find the force on a charge of -100mC located at P (2, 0, 5) in free space due to another Charge of 300 μ C located at Q (1, 2, 3). [7M]
- 2 a) Define Dot product and cross product of two vectors and state its properties. [7M]
 b) If the scalar Potential is given by the expression $\Phi=xyz$, determine potential gradient also Prove that the vector $\vec{F} = \text{grad } \varphi$ is irrotational. [7M]
- 3 a) Derive the boundary conditions for electric field between a conductor and a dielectric. [7M]
 b) State ampere circuit law in integral form. [7M]
- 4 State Gauss's law and explain any two applications of gauss law. [14M]
- 5 Using Biot Savart's Law, find H due to an infinite line current. [14M]
- 6 a) Derive the Maxwell's equations in integral form for time varying fields and based on this obtain the corresponding differential equation by applying stroke's theorem. [8M]
 b) State and explain Faraday's laws of electromagnetic induction with its integral and point forms. [6M]
- 7 Derive the wave equation in free space. [14M]
- 8 Write short Notes on [14M]
 - i. Surface impedance
 - ii. Brewster Angle
 - iii. Critical angle
 - iv. Total internal reflection

Code No: R15A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022**Electromagnetic Theory and Transmission Lines****(ECE)**

Roll No									
---------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 75****Note:** This question paper contains two parts A and B

Part A is compulsory which carries 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 In a certain homogeneous medium, the magnetic field intensity is given by [2M]
 $\mathbf{H} = yz(x^2+y^2) \mathbf{a}_x - y^2xz \mathbf{a}_y + 4x^2y^2 \mathbf{a}_z$ A/m, Find the divergence of the field.
- b Derive the expression for the Poisson's and Laplace equations [3M]
- c Distinguish between Convection and Conduction Current Densities. [2M]
- d Explain the concept of scalar and vector magnetic fields. [3M]
- e Write the difference between conductor and dielectric. [2M]
- f Define and give applications of Brewster angle. [3M]
- g Draw an equivalent circuit of a two wire transmission line [2M]
- h Calculate the characteristic impedance of a transmission line with impedance and admittance of 16 and 9 respectively. [3M]
- i Define Reflection coefficient and VSWR? [2M]
- j The input impedance of a $\lambda/8$ section of a loss less transmission line of characteristic impedance 50Ω is found to be real when the other end is terminated by a load $Z_l=R+jX$. If X is 30Ω , then determine the value of R . [3M]

PART-B (50 MARKS)**SECTION-I**

- 2 Define Gauss' law. Derive the integral and differential form of Gauss' law. [10M]
 Mention any two applications of law.

OR

- 3 a) Explain about Poisson's and Laplace's Equations. [10M]
- b) Derive expressions for Continuity equation and Relaxation Time.

SECTION-II

- 4 Define Inductance and show that the Magnetic Energy Stored in a volume is equal [10M] to $\frac{1}{2} \mathbf{B} \cdot \mathbf{H}$

OR

- 5 Write Maxwell's Equations in point form, free space, phasor form, for static [10M] fields and Time varying fields.

SECTION-III

- 6 Determine propagation constant, phase velocity and intrinsic impedance of [10M] uniform plane wave in a good conductor.

OR

- 7 Derive the expression for reflection coefficient for oblique incidence on a perfect [10M] dielectric in parallel polarization.

SECTION-IV

- 8 Derive Transmission line equation and hence define characteristic impedance [10M]
OR

- 9 Determine the conditions for Distortion less and Minimum attenuation [10M] Transmission lines.

SECTION-V

- 10 Derive the expression for input impedance of a transmission line. [10M]

OR

- 11 Explain the significance and Utility of $\lambda/8$, $\lambda//4$, and $\lambda/2$ Lines. [10M]

II B.Tech II Semester Supplementary Examinations, February 2022**Electromagnetic Theory and Transmission Lines
(ECE)**

Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION – I

01. a) Using Gauss's law, derive the expressions for electric field intensity and electric flux density due to an infinite sheet of conductor of charge density ρ C/cm. [7M]
 b) Write short note on Continuity Equation [7M]

(OR)

02. a) State and explain Coulomb's law. Obtain an expression in vector form. [7M]
 b) Define capacitance? Derive the capacitance between two parallel plates separated by a dielectric medium? [7M]

SECTION - II

03. a) What is inconsistency associated with Ampere's law and displacement current density [7M]
 b) In free space, $E = 20 \cos(\omega t - 50x)$ ay V/m, Calculate J_d , H and ω [7M]

(OR)

04. a) Define vector potential? What is the relation between vector potential and magnetic flux density? Write the Maxwell's equations related to magneto static fields? [7M]
 b) State Gauss law. Apply Gauss law to calculate the electric field both inside outside of an insulating sphere of radius a , a uniform charge density ρ and a total positive charge Q [7M]

SECTION - III

05. a) Derive the wave equations (E & M Fields) in free space? [10M]
 b) Sketch the plots of \mathbf{E} and \mathbf{H} as a function of distance and time in free space. [4M]

(OR)

06. a) Define Brewster angle and Critical angles. State where these are required. [7M]
 b) State and prove Poynting theorem. [7M]

SECTION - IV

07. Derive the condition for distortion less and minimum attenuation [14M]

(OR)

08. Draw an equivalent circuit of a 2-wire transmission line? Explain each term? State the terms series impedance, shunt admittance, primary constants and secondary constants?

[14M]

SECTION – V

09. a) Explain the basic for construction of smith chart. Illustrate as to how it can be used of an Admittance chart. [7M]

- b) Explain the design of a Smith chart? List out the applications? [7M]

(OR)

10. a) Explain Quarter wave and Half wave Transmission Line. [7M]

- b) Derive the expression for the input impedance of a transmission line length L. [7M]

Code No: R17A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B.Tech II Semester Supplementary Examinations, July 2021
Electromagnetic Theory and Transmission Lines
(ECE)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

Answer Any **Five** Questions
 All Questions carries equal marks.

01. Define Electric potential and derive the relationship between electric potential and electric field [14M]
02. a) Derive Poisson's and Laplace's equations from fundamentals. [7M]
 b) Derive the Capacitance value of a Parallel plate capacitor? [7M]
03. a) Explain the concept of Magnetic vector potential [7M]
 b) State and derive the boundary condition for electric and magnetic field at any surface of discontinuity. [7M]
04. a) Write Maxwell's equations in different final forms and in word Statements. [7M]
 b) A parallel plate capacitor with plate area of 5 cm^2 and plate separation of 3 mm has a voltage $50 \sin 10^3 t$ applied to its plates. Calculate the displacement current assuming $\epsilon = 2\epsilon_0$. [7M]
05. An EM wave propagating in a certain medium is described by

$$\mathbf{E} = 25 \sin(2\pi \times 10^6 t - 6x) \mathbf{a}_z \text{ V/m}$$
 (i) Determine the direction of wave propagation.
 (ii) Compute the period T, the wavelength λ and the velocity
 (iii) Sketch the wave at $t = 0, T/8, T/4, T/2$. [14M]
06. a) Explain the different types of polarization. [7M]
 b) Define uniform Plane wave? What are the characteristics of plane Wave? Explain. [7M]
07. Explain the transmission line parameters and also obtain the transmission line equations. [14M]
08. a) Derive the input impedance of lossless $\lambda/4$ transmission line? [7M]
 b) Write steps how to calculate impedance, reactance, and wavelength using smith chart. [7M]

Code No: R18A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022**Electromagnetic Fields & Waves****(ECE)**

Roll No									
----------------	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a) What are the different types of charge distributions and give an example [5M] for each one?
 b) Three equal point charges of $4 \mu\text{C}$ are in free space at $(0, 0, 0)$, $(2, 0, 0)$ and $(0, 2, 0)$, respectively. Find net force on $Q_4 = 6 \mu\text{C}$ at $(2, 2, 0)$ [5M]
 c) What is the limitation of Coulomb's law? [4M]

OR

- 2 a) Derive an expression for the electric field intensity due to an infinite length surface charge along the z-axis at an arbitrary point $Q(x, y, z)$ [7M]
 b) A square plate described by $-2 < x < 2$, $-2 < y < 2$, $Z = 0$ carries a charge $12|y|\text{mc/m}^2$. Find the total charge on the plate and the electric field intensity at $(0, 0, 10)$. [7M]

SECTION-II

- 3 a) State and prove Gauss's law. Express Gauss's law in both integral and differential forms [7M]
 b) Derive the Relation between Electric field Intensity and Electric Potential [7M]
 OR
- 4 a) Explain poisson's and Laplace equations and their applications [7M]
 b) State and Prove Continuity equation [7M]

SECTION-III

- 5 a) State the point forms of Ampere's circuital law and explain in detail [7M]
 b) A thin ring of radius 5cm is placed on plane $Z = 1$ cm so that its center is at $(0, 0, 1$ cm). If the ring carries 50mA along a at i) $(0, 0, -1$ cm) ii) $(0, 0, 10$ cm)

OR

- 6 a) Derive Maxwell's equations from their basics [7M]
 b) Find the frequency at which conduction current density and displacement current density are equal in a medium with $\sigma = 2 \times 10^{-4}\text{mho/mt}$ and $\epsilon_r = 81$ [7M]

SECTION-IV

- 7 a) Define uniform plane wave? Derive the corresponding mathematical expressions for it [7M]
 b) Derive the wave equations for a conducting medium [7M]

OR

- 8 a) Derive the one dimensional general wave equation and find the solution for [7M]
wave equation
b) Determine the intrinsic impedance in free space for uniform plane wave [7M]

SECTION-V

- 9 Define and distinguish between the terms perpendicular polarization, [14M]
parallel polarization, for the case of reflection by a perfect conductor under
oblique Incidence

OR

- 10 State and Prove Poynting theorem [14M]

Code No: R18A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022**Electromagnetic Fields & Waves****(ECE)**

Roll No										
----------------	--	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a) What are the different types of charge distributions and give an example [5M] for each one?
 b) Three equal point charges of $4 \mu\text{C}$ are in free space at $(0, 0, 0)$, $(2, 0, 0)$ and $(0, 2, 0)$, respectively. Find net force on $Q_4 = 6 \mu\text{C}$ at $(2, 2, 0)$ [5M]
 c) What is the limitation of Coulomb's law? [4M]

OR

- 2 a) Derive an expression for the electric field intensity due to an infinite length surface charge along the z-axis at an arbitrary point $Q(x, y, z)$ [7M]
 b) A square plate described by $-2 < x < 2$, $-2 < y < 2$, $Z = 0$ carries a charge $12|y|\mu\text{C}/\text{m}^2$. Find the total charge on the plate and the electric field intensity at $(0, 0, 10)$. [7M]

SECTION-II

- 3 a) State and prove Gauss's law. Express Gauss's law in both integral and differential forms [7M]
 b) Derive the Relation between Electric field Intensity and Electric Potential [7M]

OR

- 4 a) Explain poisson's and Laplace equations and their applications [7M]
 b) State and Prove Continuity equation [7M]

SECTION-III

- 5 a) State the point forms of Ampere's circuital law and explain in detail [7M]
 b) A thin ring of radius 5cm is placed on plane $Z = 1$ cm so that its center is at $(0, 0, 1$ cm). If the ring carries 50mA along a a) $(0, 0, -1$ cm) ii) $(0, 0, 10$ cm)

OR

- 6 a) Derive Maxwell's equations from their basics [7M]
 b) Find the frequency at which conduction current density and displacement current density are equal in a medium with $\sigma = 2 \times 10^{-4} \text{mho}/\text{mt}$ and $\epsilon_r = 81$ [7M]

SECTION-IV

- 7 a) Define uniform plane wave? Derive the corresponding mathematical expressions for it [7M]
 b) Derive the wave equations for a conducting medium [7M]

OR

- 8 a) Derive the one dimensional general wave equation and find the solution for [7M]
 wave equation
 b) Determine the intrinsic impedance in free space for uniform plane wave [7M]

SECTION-V

- 9 Define and distinguish between the terms perpendicular polarization, [14M]
 parallel polarization, for the case of reflection by a perfect conductor under
 oblique Incidence

OR

- 10 State and Prove Poynting theorem [14M]

Code No: R18A0406

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Supplementary Examinations, February 2022**Electromagnetic Fields & Waves****(ECE)**

Roll No										
----------------	--	--	--	--	--	--	--	--	--	--

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

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a) What are the different types of charge distributions and give an example [5M] for each one?
 b) Three equal point charges of $4 \mu\text{C}$ are in free space at $(0, 0, 0)$, $(2, 0, 0)$ and $(0, 2, 0)$, respectively. Find net force on $Q_4 = 6 \mu\text{C}$ at $(2, 2, 0)$ [5M]
 c) What is the limitation of Coulomb's law? [4M]

OR

- 2 a) Derive an expression for the electric field intensity due to an infinite length surface charge along the z-axis at an arbitrary point $Q(x, y, z)$ [7M]
 b) A square plate described by $-2 < x < 2$, $-2 < y < 2$, $Z = 0$ carries a charge $12|y|\mu\text{C}/\text{m}^2$. Find the total charge on the plate and the electric field intensity at $(0, 0, 10)$. [7M]

SECTION-II

- 3 a) State and prove Gauss's law. Express Gauss's law in both integral and differential forms [7M]
 b) Derive the Relation between Electric field Intensity and Electric Potential [7M]

OR

- 4 a) Explain poisson's and Laplace equations and their applications [7M]
 b) State and Prove Continuity equation [7M]

SECTION-III

- 5 a) State the point forms of Ampere's circuital law and explain in detail [7M]
 b) A thin ring of radius 5cm is placed on plane $Z = 1$ cm so that its center is at $(0, 0, 1$ cm). If the ring carries 50mA along a a) $(0, 0, -1$ cm) ii) $(0, 0, 10$ cm)

OR

- 6 a) Derive Maxwell's equations from their basics [7M]
 b) Find the frequency at which conduction current density and displacement current density are equal in a medium with $\sigma = 2 \times 10^{-4} \text{mho}/\text{mt}$ and $\epsilon_r = 81$ [7M]

SECTION-IV

- 7 a) Define uniform plane wave? Derive the corresponding mathematical expressions for it [7M]
 b) Derive the wave equations for a conducting medium [7M]

OR

- 8 a) Derive the one dimensional general wave equation and find the solution for [7M]
wave equation
b) Determine the intrinsic impedance in free space for uniform plane wave [7M]

SECTION-V

- 9 Define and distinguish between the terms perpendicular polarization, [14M]
parallel polarization, for the case of reflection by a perfect conductor under
oblique Incidence

OR

- 10 State and Prove Poynting theorem [14M]

Code No: R18A0406**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular/Supplementary Examinations, July 2021
Electromagnetic Fields & Waves
(ECE)

Roll No									
----------------	--	--	--	--	--	--	--	--	--

Time: 3 hours**Max. Marks: 70**Answer Any **Five** Questions

All Questions carries equal marks.

- 1** a) Convert a point P(1,3,5) from cartesian to cylindrical and spherical coordinates [4M]
 b) Point charger 6 nc and – 3 nc are located at (3,2,-1) and (-1,-1,4) [10M]
 respectively i) Determine the force on a 1nc point charge located at (0,3,1) ii)
 Find the electric field intensity at that point
- 2** a) State and explain Coulomb's law of electrostatic field in vector form [7M]
 b) Define electric field intensity at a point. Derive the expression for E of a [7M]
 line charge infinite.
- 3** a) Define Gauss' law. Apply Gauss law to derive the boundary conditions at a [7M]
 conductor-dielectric interface
 b) Define electric potential and obtain expression for electric potential due to [7M]
 n point charges.
- 4** a) Obtain the boundary conditions at the boundary of two dielectric materials [10M]
 b) Derive Poisson's and Laplace equations from fundamentals [4M]
- 5** a) Find an expression for the magnetic field produced by a straight current [10M]
 carrying conductor placed along Z-axis
 b) Explain about scalar magnetic potential and vector magnetic potential [4M]
- 6** a) State and explain Faraday's law of electromagnetic induction [4M]
 b) State Maxwell's equations in differential form and write down their word [10M]
 statements
- 7** Discuss about uniform plane wave in lossless dielectrics and conductors [14M]
 and establish the relationship between electric and magnetic field in the
 both medium
- 8** a) Write short notes on the following: a) Brewster angle b) Total Internal [10M]
 Reflection
 b) Explain the reflection and refraction of plane waves [4M]

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester

INTRODUCTION TO DBMS

(Common to ECE, EEE, ME, AE)

Time: 3 hours

Max. Marks: 70

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. List the differences between a file processing system and DBMS.
- b. Define DBMS. Explain the various Database languages with examples.
(OR)
- 2a. Explain the three levels of abstraction.
- b. Explain applications of DBMS and different data models.

SECTION-II

- 3 a. Explain the E-R diagram components and notations with their extended features?
- b. Explain the following with examples.
 a)Primary Key. b) Foreign key c) Candidate key

(OR)

- 4 a. Mention the different types of attributes with examples.
- b. Explain the features of E-R model and its design issue constraints.

SECTION-III

- 5a. Explain the following. a) Types of Join Operations b) Set Operations
- b. Explain about aggregate functions and null values.

(OR)

- 6a. Explain the SQL queries -UNION, INTERSECT, and EXCEPT with examples.
- b. Explain about nested queries and triggers.

SECTION-IV

7. What is Normalization? Discuss what are the types? Discuss the 1NF, 2NF, 3NF with example?

(OR)

8. Define Functional dependencies? How are primary keys related to functional dependencies?

SECTION-V

9. What are the transaction isolation levels in SQL?

(OR)

10. Explain serializability and lock modes.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
II B. Tech II Semester
INTRODUCTION TO DBMS
(Common to ECE, EEE, ME, AE)

Time: 3 hours

Max. Marks: 70

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. Explain about the three schema architecture of DBMS.
- b. What are the Functional components of a DBMS .
(OR)
- 2a. Explain the advantages of DBMS.
- b. Explain the role of a Database administrator.

SECTION-II

- 3 a. Explain the basic concepts of E-R model and their symbols.
- b. Differentiate between strong entity and weak entity with examples.
(OR)
- 4 a. Mention the features of relational model.
- b. Explain the different types of keys in DBMS.

SECTION-III

- 5a. Explain the following in SQL with examples. a) Nested Queries b) Correlated Queries
- b. Explain about aggregate functions and null values.
(OR)
- 6a. Explain various DML functions in SQL with examples.
- b. Explain the following in SQL with examples
 a) Group by and Having Clauses b) Triggers

SECTION-IV

7. Define BCNF? How does BCNF differ from 3NF? Explain with an example.
(OR)
8. Explain the importance of good schema design and the problems encountered with bad schema designs.

SECTION-V

9. Explain about the transaction concept and its desirable properties.
(OR)
10. Explain how the data will be recovered by concurrent transactions.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B. Tech II Semester

INTRODUCTION TO DBMS

(Common to ECE, EEE, ME, AE)

Time: 3 hours

Max. Marks: 70

Note: Question paper Consists of 5 SECTIONS (One SECTION for each UNIT). Answer FIVE Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

SECTION-I

- 1 a. Differentiate between a file processing system and DBMS.
 - b. Explain about the architecture of DBMS .
- (OR)**
- 2a. Explain about various database users and administrators in DBMS..
 - b. Explain the types of DBMS languages.

SECTION-II

- 3 a. Explain the basic concepts of relational model.
- b. What are the key constraints? Explain the design issues of ER model.

(OR)

- 4 a. Draw an ER-Diagram for Weak entity set and Strong entity set with example.
- b. Explain the E-R diagram components and notations with their extended features?.

SECTION-III

- 5a. Explain different types of Join Operations with relevant examples.
- b. Explain about aggregate functions and null values.

(OR)

- 6a. Explain various DDL functions in SQL with examples.
- b. Explain the following in SQL with examples
 a) Set operators b) nested queries

SECTION-IV

7. Define Functional dependencies. What are the Armstrong's axioms for FD's?
- (OR)**
8. What is Normalization? Discuss what are the types? Discuss the 1NF, 2NF, 3NF with example?

SECTION-V

9. Explain transaction definition in SQL with example.
- (OR)**
10. What is serializability? Explain Concurrency Control by Timestamps .