CODE: A1EC405T | **R23** | **H.T.No:**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations December 2025

Subject Name: **ANALOG AND DIGITAL COMMUNICATIONS**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Define modulation. Give its advantages.	2M	CO1	L2
	b	Justify the need for modulation.	2M	CO1	L3
	c	What are different types of noise?	2M	CO2	L1
	d	Define sensitivity and selectivity of receiver.	2M	CO2	L2
	e	What is orthonormal signal space.	2M	CO3	L1
	f	Mention characteristics of Radio Receiver.	2M	CO3	L2
	g	Define pulse modulation.	2M	CO4	L2
	h	What is correlation receiver.	2M	CO4	L1
	i	Sketch signal Constellation diagram for QPSK.	2M	CO5	L2
	j	Illustrate the signal space diagram for QAM signal for M=8	2M	CO5	L1
PART-B					
UNIT-I					
2	a	Explain with diagrams, the generation of AM. Derive its efficiency.	5M	CO1	L2
	b	Find the modulation index for an amplitude modulation. Consider an AM signal s(t) = 2 cos ($2\pi fct$) + 0.5 cos (2 πfmt). Cos ($2\pi fct$). Compute the modulation index used to generate the signal.	5M	CO1	L3
OR					
3		Explain with neat diagram the pre-emphasis and de-emphasis circuits in frequency modulation.	10M	CO2	L3
UNIT-II					
4	a	Compare PCM, DPCM & DM.	5M	CO2	L3
	b	Explain how PPM can be generated from PWM signal.	5M	CO2	L2
OR					
5	a	Explain the noise performance of FM system.	5M	CO2	L2
	b	What are properties of matched filter?	5M	CO3	L3
UNIT-III					
6	a	Explain FM receiver with neat diagram.	5M	CO3	L4
	b	Briefly explain the concept of eye pattern.	5M	CO3	L3
OR					
7	a	What is ISI? How this can be minimized?	5M	CO3	L1
	b	Explain operation of QAM transmitter and receiver with neat block diagram.	5M	CO3	L2
UNIT-IV					
8	a	Explain the Gram-Schmidt orthogonalization procedure.	5M	CO4	L3
	b	Explain with neat block diagram the structure and behavior of matched filter receiver.	5M	CO4	L2
OR					
9	a	Classify the types of PCM sampling and conclude its operation with appropriate diagrams.	5M	CO4	L2
	b	Write a brief note on geometric representation of signals.	5M	CO4	L2
UNIT-V					
10	a	Derive the error probability for QPSK.	5M	CO5	L3
	b	With block diagram, explain the generation and detection of DPSK.	5M	CO5	L2
OR					
11	a	Express the BPSK waveform for the given 1011 data.	5M	CO5	L3
	b	Derive the expression for probability of error for coherent FSK.	5M	CO5	L3

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CODE: A14403T **R23**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations May 2025

Subject Name: **ELECTRONIC CIRCUITS ANALYSIS**

Time: 3 Hours Branch: CSE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	What is the main advantage of a Darlington pair?	2M	CO1	L1
	b	Sketch the basic circuit of a MOS differential pair.	2M	CO1	L2
	c	What is the gain-bandwidth product of an amplifier?	2M	CO2	L1
	d	Define the parameters f_β and f_T for a BJT	2M	CO2	L1
	e	State the Barkhausen criteria for sustained oscillations.	2M	CO3	L1
	f	What is current shunt feedback?	2M	CO3	L1
	g	Explain the term "load line" in power amplifier design.	2M	CO4	L1
	h	List the advantages of using MOS power transistors in output stages.	2M	CO4	L1
	i	Draw the frequency response of double tuned Amplifier.	2M	CO5	L1
	j	Define Astable multivibrator	2M	CO5	L1
PART-B					
UNIT-I					
2	a	Discuss the nonideal characteristics of a differential amplifier, including input bias current and input offset voltage, and their effects on circuit performance.	5M	CO1	L1
	b	Explain the operation of a BJT differential pair. Discuss the significance of its CMRR.	5M	CO1	L1
OR					
3	a	Describe the small-signal operation of an NMOS differential pair. Derive the expressions for the differential gain and common-mode gain.	10M	CO1	L1
UNIT-II					
4	a	Explain the factors that determine the low-frequency response of a Common Source (CS) amplifier. Derive the expression for the lower cutoff frequency due to the coupling capacitor.	10M	CO2	L2
OR					
5	a	Explain the significance of fβ and fT in characterizing the high-frequency performance of a BJT. Derive the relationship between them.	10M	CO2	L2
UNIT-III					
6	a	Draw the circuit diagram of a RC phase shift oscillator and calculate the cutoff frequency (fc) and open loop gain (A) with the given values. Does it fulfill the Barkhausen criteria? Justify your answer. $R_f = 10k\Omega$, $R_1 = 1k\Omega$, $R = 2k\Omega$, $C = 10pF$	10M	CO3	L4
OR					
7	a	Explain current shunt and voltage shunt feedback amplifiers and derive the expression for gain, input & output resistance.	10M	CO3	L2
UNIT-IV					
8	a	Explain the working of a Class A amplifier in transformer-coupled mode in detail. Also, Derive the formula for the maximum efficiency of the amplifier.	10M	CO4	L4
OR					
9	a	Describe the working of a Class A output stage. Derive its efficiency and discuss its advantages and disadvantages.	10M	CO4	L2
UNIT-V					
10	a	Derive the expression for quality factor of a single tuned inductively coupled amplifier	10M	CO5	L3
OR					
11	a	Design and explain about Monostable multivibrator	5M	CO5	L4
	b	Write the difference between Bistable,Astable and Monostable multivibrator	5M	CO5	L2

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CODE: A14402 **R23**

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations December 2025

Subject Name: **EM WAVES AND TRANSMISSION LINES**

Time: 3 Hours Branch: ECE **Max. Marks: 70**

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

		PART-A			
1	a	Convert point P(6,2,-4) into Cylindrical coordinate system.	2M	CO1	L3
	b	Write vector force on Q_2 due to Q_1 using Coulomb's law if their vector distance is $\mathbf{R_{12}} = R_{12}\mathbf{a_r}$.	2M	CO1	L2
	c	Define magnetic flux density **B**.	2M	CO2	L1
	d	State Ampere's circuit law.	2M	CO2	L1
	e	Write wave equation for **E** and **H** in free space.	2M	CO3	L2
	f	Define a Uniform plane wave.	2M	CO4	L1
	g	What are the different types of transmission lines?	2M	CO5	L1
	h	What are the different types of distortions in a transmission line?	2M	CO5	L1
	i	What is the relationship between reflection coefficient and VSWR?	2M	CO5	L1
	j	What is a matched transmission line?	2M	CO5	L1
		PART-B			
		UNIT-I			
2	a	Derive the capacitance of a parallel plate capacitor.	5M	CO1	L2
	b	A point charge Q = -3π mC at (3,0,0) and a line charge 5π mC/m along the y-axis, find the electric flux density **D** at P(5,0,4).	5M	CO1	L2
		OR			
3	a	Find electric field strength **E** due to an infinite line charge of 10 C/m. Derive the relation used.	5M	CO1	L3
	b	What is current and current density? Discuss convection and conduction currents.	5M	CO1	L2
		UNIT-II			
4	a	Discuss Faraday's law with neat sketches, derive the Maxwell's equation relating to it?	5M	CO2	L3
	b	A parallel plate capacitor with a plate area of $10cm^2$ and plate separation of 10mm has a voltage $30\sin 10^4 t$ volts applied to its plates. Estimate the displacement current in a medium with $\varepsilon_r=5$.	5M	CO2	L3
		OR			
5	a	Explain the line, surface and volume current elements and write expressions for **H** due to them.	5M	CO2	L5
	b	Write final forms of Maxwell's equations for time varying fields in both differential and integral forms. Give their word statements.	5M	CO2	L1
		UNIT-III			
6	a	Derive the wave equation for electric fields in free space.	5M	CO3	L1
	b	Find attenuation constant, phase shift constant and intrinsic impedance for ferrite at 10GHz, for ferrite $\epsilon_r=9$, $\mu_r=4$, conductivity=10 mS/m.	5M	CO3	L3
		OR			
7	a	Derive ratio of E to H for a uniform plane wave in free space with all the necessary equations.	5M	CO3	L1
	b	State and prove Poynting theorem with necessary equations.	5M	CO3	L1
		UNIT-IV			
8	a	Explain Transmission line primary and secondary parameters.	5M	CO4	L5
	b	A lossy cable has R=2.75Ω/m, L=2μH/m, C=0.5pF/m and G=0 operates at f=0.6GHZ. Find attenuation constant, phase shift constant of line.	5M	CO4	L3
		OR			
9	a	Prove that a line will be distortion less if CR=LG.	5M	CO4	L1
	b	Write short notes on shorted, open circuited and matched lines.	5M	CO4	L1
		UNIT-V			
10	a	What is VSWR? Calculate the VSWR of a line with $Z_0=50\Omega$, $Z_L=60\Omega$.	5M	CO5	L3
	b	Explain the salient features of r-circles and x-circles of a Smith chart.	5M	CO5	L5
		OR			
11	a	Derive the input impedance of a lossy line.	5M	CO5	L2
	b	Difference between lossy and lossless transmission lines.	5M	CO5	L1

H.T.No:

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations December 2025

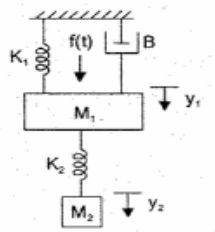
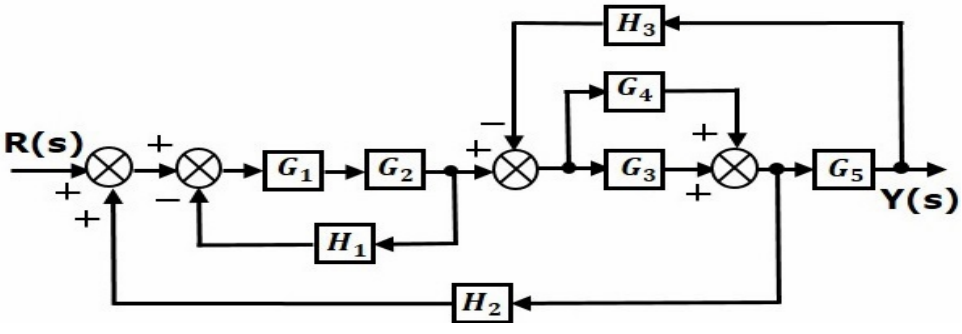
Subject Name: **Linear Control Systems**

Branch: ECE

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

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	What is the effect of positive feedback on stability?	2M	CO1	L1
	b	Write the Mason's gain formula of signal flow graph?	2M	CO1	L2
	c	What is the necessary and sufficient condition for stability in Routh's stability criterion?	2M	CO2	L1
	d	How do you find the type of a control system?	2M	CO2	L2
	e	How do you determine the centroid and angle of asymptotes?	2M	CO3	L1
	f	Define BIBO stability?	2M	CO3	L2
	g	What is meant by lag compensation?	2M	CO4	L1
	h	What is Polar plot?	2M	CO4	L2
	i	State various properties of STM	2M	CO5	L1
	j	Define controllability	2M	CO5	L2
PART-B					
UNIT-I					
2	a	Explain with a neat sketch, the working of Synchro transmitter and Receiver.	5M	CO1	L3
	b	Determine the transfer function $\frac{Y2(s)}{F(s)}$ From the following Mechanical translational system 	5M	CO1	L2
OR					
3		Find the transfer function Y(S) / R(S) for the system using block diagram reduction technique. 	10M	CO1	L3
UNIT-II					

4	a	Define the following time domain specifications: (i) Rise time. (ii) Delay time. (iii) Peak time (iv) Peak over shoot. (v) Settling time.	5M	CO2	L3
	b	Obtain the response of a first order system C(s)/R(s) = 1/1+sT for unit step input.	5M	CO2	L4
		OR			
5	a	Derive the expression for 2nd order system under damped system with unit step as input.	5M	CO2	L3
	b	The open loop, transfer function of a unity feedback system is $G(S)$ = 1/1+S Using generalized error series determine the steady state error when the system is excited by $R(t) = 1 + t + t2$.	5M	CO2	L2
		UNIT-III			
6	a	By using Routh criterion, determine the stability of the system represented by the characteristics equation $S^5 + S^4 + 2S^3 + 2S^2 + 11S + 10 = 0$	10M	CO3	L3
		OR			
7	a	Sketch the root locus of the system whose open loop transfer function is G(s) = $\frac{k}{S(S+2)(S+4)}$ Find the value of K so that the damping ratio of the closed loop system is 0.5	10M	CO3	L4
		UNIT-IV			
8	a	Sketch the Bode plot and determine the Gain Margin and Phase margin for the open transfer function $\boldsymbol{G(s) = \frac{8}{s(1+0.3s)(1+0.1s}}$	10M	CO4	L4
		OR			
9	a	Explain the Lag compensator network with design steps?	10M	CO4	L2
		UNIT-V			
10	a	Obtain the state model of the system described by $\boldsymbol{\frac{Y(S)}{U(S)} = \frac{5}{S^2+6s+7}}$	5M	CO5	L4
	b	Sate the properties of STM?	5M	CO5	L2
		OR			
11	a	Check the controllability and observability of system described by $x = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -1 & -5 & -1 \end{bmatrix} X + \begin{bmatrix} 0 \\ 5 \\ -24 \end{bmatrix} u;\ y = [1 \quad 0 \quad 0]x + [0]u$	5M	CO5	L3
	b	Explain about diagonalization.	5M	CO5	L2

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CODE: A1HS401a	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations Dec 2025

Subject Name: Managerial Economics and Financial Analysis

Branch: CSE & ECE

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

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Explain the demand function?	2M	CO1	BTL2
	b	Identify 4 factors that influence demand forecasting.	2M	CO1	BTL1
	c	Calculate the break-even point if fixed costs are Rs. 50,000, variable cost per unit is Rs. 20, and selling price per unit is Rs. 50.	2M	CO2	BTL1
	d	Explain the concept of least cost combination?	2M	CO2	BTL2
	e	Explain two key differences between a sole proprietorship and a partnership firm.	2M	CO3	BTL2
	f	Explain the features of sole-proprietary business?	2M	CO3	BTL2
	g	What is the significance of capital budgeting in financial decision-making?	2M	CO4	BTL1
	h	List and explain the components of working capital?	2M	CO4	BTL1
	i	What is the significance of liquidity ratios?	2M	CO5	BTL1
	j	Explain about liquidity ratio?	2M	CO5	BTL2
PART-B					
UNIT-I					
2	a	Define Managerial Economics. Explain how managerial economics is linked with other disciplines.	5M	CO1	BTL1
	b	What is the Law of Demand? What are their assumptions and exceptions?	5M	CO1	BTL1
OR					
3	a	What is demand forecasting? Discuss briefly various methods of forecasting.	5M	CO1	BTL1
	b	What is the role of managerial economist in modern business?	5M	CO1	BTL1
UNIT-II					
4	a	Solve the following problem, Fixed cost Rs 7500/-, sales Rs 40000/-, variable cost Rs 17500/-. Calculate contribution, profit, BEP, Margin of safety.	5M	CO2	BTL6
	b	Explain the cost-out put relationship both in short run and long run?	5M	CO2	BTL2
OR					
5	a	From the following data, you are required to calculate: (i) P/V ratio. (ii) Break-even sales with the help of P/V ratio. (iii) Sales required earning a profit of Rs. 4, 50,000. Fixed expenses = 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.	10M	CO2	BTL4

<table>
<tr><td colspan="6">UNIT-III</td></tr>
<tr><td rowspan="2">6</td><td>a</td><td>Explain different forms of business organizations</td><td>5M</td><td>CO3</td><td>BTL2</td></tr>
<tr><td>b</td><td>Define partnership? Explain its characteristics?</td><td>5M</td><td>CO3</td><td>BTL1</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">7</td><td>a</td><td>Explain the pricing methods?</td><td>5M</td><td>CO3</td><td>BTL2</td></tr>
<tr><td>b</td><td>What are the features of monopolistic competition? How can a firm attain equilibrium position?</td><td>5M</td><td>CO3</td><td>BTL1</td></tr>
<tr><td colspan="6">UNIT-IV</td></tr>
<tr><td>8</td><td>a</td><td>Evaluate the role of working capital management in ensuring financial stability for a business.</td><td>10M</td><td>CO4</td><td>BTL2</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">9</td><td>a</td><td>Solve the following problem. A project required an investment of Rs 50k, which is generating the cash flows Rs 18k, 22K, 24K, 15K and 12k over its life time. Cost of the capital is 12%. Compute NPV of the project?</td><td>5M</td><td>CO4</td><td>BTL3</td></tr>
<tr><td>b</td><td>What are the factors influencing working capital of a firm?</td><td>5M</td><td>CO4</td><td>BTL1</td></tr>
<tr><td colspan="6">UNIT-V</td></tr>
<tr><td>10</td><td>a</td><td>Analyse the role and importance of financial statements in decision-making.</td><td>10M</td><td>CO5</td><td>BTL2</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>11</td><td>a</td><td>The following trial balance has been extracted from the books of Mr. Rao on 31.03.2003. Trial balance
<table>
<tr><th>Particulars</th><th>Debit (Rs.)</th><th>Credit (Rs)</th></tr>
<tr><td>Machinery</td><td>40,000</td><td></td></tr>
<tr><td>Cash at bank</td><td>10,000</td><td></td></tr>
<tr><td>Cash in hand</td><td>5,000</td><td></td></tr>
<tr><td>Wages</td><td>10,000</td><td></td></tr>
<tr><td>Purchases</td><td>80,000</td><td></td></tr>
<tr><td>Stock (01.04.2002)</td><td>60,000</td><td></td></tr>
<tr><td>Sundry debtors</td><td>40,000</td><td></td></tr>
<tr><td>Bills debtors</td><td>29,000</td><td></td></tr>
<tr><td>Rent</td><td>4,000</td><td></td></tr>
<tr><td>Interest on bank loan</td><td>500</td><td></td></tr>
<tr><td>Commission received</td><td></td><td>3,000</td></tr>
<tr><td>General expenses</td><td>12,000</td><td></td></tr>
<tr><td>Salaries</td><td>7,500</td><td></td></tr>
<tr><td>Discount received</td><td></td><td>4,000</td></tr>
<tr><td>Capital</td><td></td><td>90,000</td></tr>
<tr><td>Sales</td><td></td><td>1,20,000</td></tr>
<tr><td>Bank loan</td><td></td><td>40,000</td></tr>
<tr><td>Sundry creditors</td><td></td><td>40,000</td></tr>
<tr><td>Purchase return</td><td></td><td>5,000</td></tr>
<tr><td>sales return</td><td></td><td>4,000</td></tr>
</table>
Adjustments:
(i) Closing stock = Rs. 80,000.
(ii) Interest on bank loan not yet paid = Rs. 400.
(iii) Commission received in advance = Rs. 1,000.
Prepare final account for the year ended 31.03.2003</td><td>10M</td><td>CO5</td><td>BTL4</td></tr>
</table>