CODE: A1EC405T	R23	H.T.No:										

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations APRIL 2026

Analog and Digital Communication

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	What is the need for modulation?	2M	CO1	L2
	b	Define selectivity and Fidelity of radio receivers?	2M	CO1	L2
	c	Define sampling theorem with statement	2M	CO2	L2
	d	Define Noise equivalent Bandwidth & Noise Figure	2M	CO2	L1
	e	List any two properties of matched filter.	2M	CO3	L2
	f	List the merits of eye pattern in pulsed binary data transmission system.	2M	CO3	L2
	g	Define passband transmission model.	2M	CO4	L1
	h	What is Schwarz inequality?	2M	CO4	L3
	i	State Shannon Hartley theorem.	2M	CO5	L1
	j	Draw signal constellation diagrams for BPSK & QPSK	2M	CO6	L1

PART-B

UNIT-I

2		Define modulation. Explain its benefits and applications.	10M	CO1	L2

OR

3		Compare AM, PM and FM.	10M	CO1	L3

UNIT-II

4		Discuss in detail delta modulation and demodulation with block diagram and explain the working with waveform	10M	CO2	L3

OR

5		With neat block diagram, explain the PCM communication system.	10M	CO2	L3

UNIT-III

6	a	Construct duo binary system with and without precoder for the binary data sequence 001101001	5M	CO3	L3
	b	Interpret in brief about Modified Duobinary signaling scheme.	5M	CO3	L3

OR

7		With the help of a block diagram explain base band binary data transmission	10M	CO3	L3

UNIT-IV

8		Apply Gram–Schmidt procedure to a set of signals and construct orthonormal basis functions. Represent signals in signal space and analyze dimensionality.	10M	CO4	L3

OR

9		Compare coherent and non-coherent detection techniques and analyze performance degradation due to phase uncertainty.	10M	CO4	L2

UNIT-V

10	a	Derive the expression for probability of error for coherent FSK.	5M	CO5	L2
	b	Give the comparison of power and bandwidth requirements for various digital modulation schemes.	5M	CO6	L2

OR

11		Given 8 messages with probabilities 0.25,0.0625,0.125,0.25,0.125,0.0625,0.0625 & 0.0625. Calculate efficiency by using Shannon fano coding & Huffman coding	10M	CO6	L4

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CODE: A19401	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations MAY 2026

DESIGN THINKING FOR INNOVATION

Time: 3 Hours Branch: CSE & 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	Name any four principles of design and briefly describe them.	2M	CO1	L2
	b	What are the key differences between elements and principles of design?	2M	CO1	L2
	c	What is a customer journey map, and why is it useful in design thinking?	2M	CO2	L2
	d	Why is empathy important in the design thinking process?	2M	CO2	L1
	e	Interpret the idea of 'flow from idea to innovation'.	2M	CO3	L2
	f	Compare the key differences between innovation and creativity.	2M	CO4	L3
	g	Summarize the purpose of product planning.	2M	CO5	L1
	h	Give one example of a functional specification for a smartphone.	2M	CO5	L3
	i	Summarize the concept of 'strategic innovation'.	2M	CO6	L1
	j	State the various fields of applications for design thinking.	2M	CO6	L1
PART-B					
UNIT-I					
2		How does design thinking differ from traditional problem-solving approaches? Also give an example.	10M	CO1	L3
OR					
3		Explain a real-world example where design thinking has been successfully applied to solve a problem.	10M	CO1	L3
UNIT-II					
4		How does the design thinking process enhance product development? Provide an industry example.	10M	CO2	L3
OR					
5		Explain how design thinking can be applied to create social impact. Provide a case study.	10M	CO2	L3
UNIT-III					
6	a	How can an organization transition from creativity to innovation? Describe a step-by-step process.	5M	CO3	L3
	b	Explain how you would measure the value of creativity in a software company.	5M	CO4	L3
OR					
7		Create a scoring rubric to evaluate the impact of creativity in student projects. Test it on a hypothetical project.	10M	CO4	L3
UNIT-IV					
8	a	How does a product be defined? Explain its classification.	5M	CO5	L3
	b	Discuss the innovation in materials with an example.	5M	CO5	L3
OR					
9		Create a rubric to evaluate the quality of product specifications in student design projects.	10M	CO5	L6
UNIT-V					
10	a	Stimulate how can a large corporation use design thinking to meet corporate needs like cost reduction?	5M	CO6	L3
	b	Apply design thinking to a startup's business model? Give a stepwise approach.	5M	CO6	L3
OR					
11		Design a real corporate problem (e.g., low employee engagement) and use design thinking to develop and test a prototype solution for the business process.	10M	CO6	L6

CODE: A1EC404T	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations APRIL 2026

Sub: Electronic Circuits Analysis 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 are the needs for biasing?	2M	CO1	L2
	b	In a differential amplifier, the input bias current is 0.5 μA. What is the effect of this bias current on the output voltage if the load resistance is 10 kΩ?	2M	CO1	L3
	c	How does the Miller effect influence the frequency response of a BJT amplifier?	2M	CO2	L2
	d	What is mean by Gain Bandwidth product?	2M	CO2	L2
	e	List properties of negative feedback	2M	CO3	L2
	f	A Hartley oscillator has L_1 =2 mH, L_2=3 mH, C=0.01 μF.Find frequency.	2M	CO4	L3
	g	Define Class AB amplifier	2M	CO5	L2
	h	Compare push-pull amplifier, power amplifier.	2M	CO5	L2
	i	Define stagger tuning.	2M	CO6	L2
	j	An astable multivibrator has R_1=R_2=10 $k\Omega$, C_1=C_2=0.01 μF. Find frequency.	2M	CO6	L3
PART-B					
UNIT-I					
2		Derive the expression for the voltage gain of a cascode amplifier in terms of the transconductance and output resistance of the transistors.	10M	CO1	L3
OR					
3		Derive the necessary equations for the operation of an RC-coupled amplifier using a Bipolar Junction Transistor (BJT). Consider the small-signal analysis and relevant parameters in your derivations.	10M	CO1	L3
UNIT-II					
4		Design a Common-Emitter amplifier with a voltage gain of 50 dB and calculate its low-frequency bandwidth considering coupling and bypass capacitors.	10M	CO2	L5
OR					
5		Explain the high-frequency response of an emitter-follower amplifier and calculate the bandwidth considering the effects of f_T	10M	CO2	L3
UNIT-III					
6		Derive the expression for voltage gain, input resistance, output resistance of the voltage shunt feedback amplifier?	10M	CO3	L3
OR					
7	a	Compare voltage-series and current-series feedback configurations.	5M	CO3	L4
	b	a Wien bridge oscillator, if the required frequency is 1 kHz and C = 0.01 μF, Calculate the required resistance value.	5M	CO4	L3
UNIT-IV					
8		Compare Class A, Class B and Class C power amplifiers.	10M	CO5	L4
OR					
9		Describe the structure and working of MOS Power Transistors. Compare with power BJTs in terms of speed, power handling, and applications.	10M	CO5	L4
UNIT-V					
10		Design a fixed-bias bi-stable circuit using n-p-n transistors given V_{CC}=12V, V_{BE}(sat) = 0.7V ,V_{CE}(sat)=0.3 V , h_{FE}(min)=20. Assume a specific collector current I_C(sat)	10M	CO6	L3
OR					
11		Design a monostable multivibrator to produce a pulse width of 2 ms.	10M	CO6	L3

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CODE: A1EC403	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations APRIL 2026

Sub: EM WAVES & TRANSMISSION LINES 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	Define Electric flux density.	2M	CO1	L2
	b	Obtain the expression of E due to volume charge	2M	CO1	L2
	c	Define faradays law.	2M	CO2	L2
	d	Define magnetic flux and flux density.	2M	CO2	L2
	e	Analyze t the power loss in a plane conductor?	2M	CO3	L2
	f	What is skin depth	2M	CO4	L2
	g	Write the expression for characteristic impedance.	2M	CO5	L2
	h	List out the types of Transmission lines.	2M	CO5	L2
	i	Explain about the Standing wave ratio?	2M	CO6	L2
	j	What is stub? Why used single stub matching?	2M	CO6	L2
		PART-B			
		UNIT-I			
2	a	State Coulomb's law of force between any two-point charges and derive the force equation for N-point charges.	5M	CO1	L3
	b	Derive Poisson's and Laplace's equations from fundamentals of Gauss Law.	5M	CO1	L3
		OR			
3		What is electric filed intensity? Derive an expression for E due to infinite sheet charge.	10M	CO1	L3
		UNIT-II			
4		Mention Maxwell's equation in integral and differential form for time varying fields.	10M	CO2	L3
		OR			
5	a	Derive the boundary conditions for the Electrostatic fields at the boundary between two perfect dielectrics.	5M	CO2	L3
	b	State and prove Ampere's circuital law and mention its applications.	5M	CO2	L3
		UNIT-III			
6		Analyze the wave propagation in lossy dielectric medium and derive expressions for α, β in lossy dielectric medium.	10M	CO3	L3
		OR			
7	a	Derive the wave equation for electric fields in free space.	5M	CO3	L3
	b	Find attenuation constant, phase shift constant, and intrinsic impedance for ferrite at10 GHz, given $\varepsilon_r = 9$, $\mu_r = 4$, $\sigma = 10$ mS/m.	5M	CO3	L3
		UNIT-IV			
8		A Telephone line has R=30Ω/km, L=100mH/km, G=0, C=20μF/km.At f=1kHz, obtain (i) characteristic impedance (ii) propagation constant (iii) phase velocity	10M	CO5	L3
		OR			
9	a	A lossless transmission line with Z0=50Ω is 30 m long and operates at 2 MHz. The line is terminated with a load ZL=60+j40Ω. If u=0.6c on the line, find:(a) The reflection coefficient Γ (b) The standing wave ratio s (c) The input impedance	10M	CO5	L3
		UNIT-V			
10	a	Analyze the Smith Chart and demonstrate how it is used to determine input impedance and reflection coefficient.	10M	CO6	L6
		OR			
11	a	Calculate the input impedance of a lossless line terminated with i) $Z_L=0$ ii) $Z_L=Z_0$ iii) $Z_L=\infty$.	10M	CO6	L3

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CODE: A1EC402	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations APRIL 2026

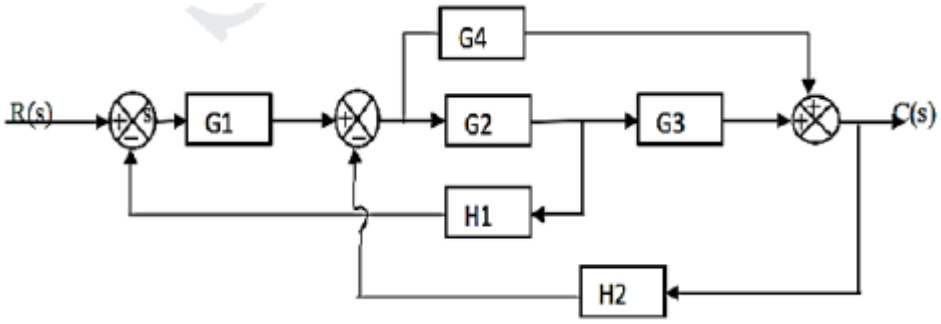
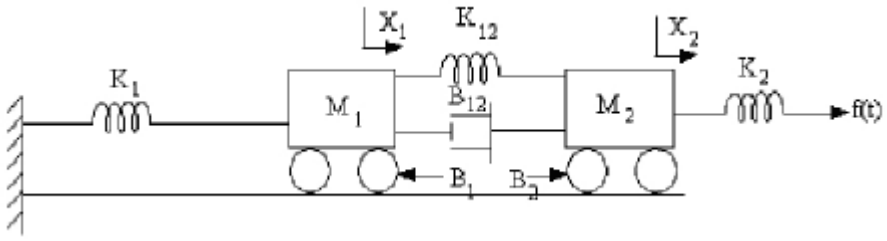
Linear Control Systems

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	Explain how to reduce two blocks in parallel using the block diagram reduction technique	2M	CO1	L2
	b	Write Mason's Gain Formula.	2M	CO1	L2
	c	Write the standard second-order transfer function and define damping ratio.	2M	CO2	L2
	d	Mention the effect of a PD controller on transient response.	2M	CO2	L2
	e	Define root locus.	2M	CO3	L2
	f	Interpret to find the crossing point of root locus in imaginary axis?	2M	CO4	L3
	g	Illustrate the condition for stability in Bode diagram.	2M	CO5	L4
	h	For a second-order system, ζ=0.5, ω_n=10 rad/s. Find Resonant Peak ω_r?	2M	CO5	L3
	i	What is Diagonalize matrix?	2M	CO6	L2
	j	What are the advantages of state space analysis	2M	CO6	L2
PART-B					
UNIT-I					
2	a	Simplify the following diagram using block diagram reduction method. Also derive the transfer function of the same using signal flow graph. 	10M	CO1	L3
OR					
3	a	Draw the force-current analogous circuit for given below figure. 	10M	CO1	L3
UNIT-II					
4	a	A unity-feedback system with $G(s)=K(1+2s)$ / $s(s+3)$ should have 16% overshoot and $tp=1s$. Find K and discuss how ζ and ω_n are obtained.	10M	CO2	L3
OR					
5	a	Derive the equation for transfer function of P,PI,PD and PID controllers.	10M	CO2	L3
UNIT-III					

6	a	A unity feedback control system has an open loop transfer function: $G(s)=\frac{K}{s(s^2+4s+13)}$ Sketch the root locus by writing all the steps	10M	CO3	L3
		OR			
7	a	Construct R-H array and determine the stability of a system representing the characteristic equation $9s5 +20s4 +10s3 + s2 + 9s +10= 0$ .Comment on location of the roots of the characteristics equation.	5M	CO4	L3
	b	Analyze the effect of adding poles and zeros on root locus.	5M	CO4	L4
		UNIT-IV			
8		The open loop transfer function of a system is given by $G(s)=\frac{20}{s(s+1)(1+0.01s)}$ Sketch the bode plot and determine gain margin and Phase margin.	10M	CO5	L3
		OR			
9	a	Derive the expressions for Resonant peak and Resonant frequency for second order system.	10M	CO5	L3
		UNIT-V			
10	a	A state variable description of a system is given $\dot{X}=\begin{bmatrix}0 & 5\\ -1 & -2\end{bmatrix}X+\begin{bmatrix}1\\1\end{bmatrix}u$ by the matrix equation, Y=[1 1]X Find (i) The State transition matrix (ii) The Transfer function (iii) Draw State diagram	10M	CO6	L3
		OR			
11	a	Explain the principle of duality between controllability and observability.	5M	CO6	L2
	b	Construct the state model of the system described by the following transfer function: $\frac{Y(s)}{U(s)}=\frac{5}{s^2+6s+7}$	5M	CO6	L3

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CODE: A1HS401	R23	H.T.No:									

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B. Tech II Year II Semester Regular Examinations APRIL 2026

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Time: 3 Hours **(CSE &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	What is cross elasticity of demand?	2M	CO1	L2
	b	Write the significance of Managerial Economics in Decision Making.	2M	CO1	L2
	c	Differentiate between short-run and long-run production functions.	2M	CO2	L2
	d	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	L2
	e	What is monopolistic competition?	2M	CO3	L2
	f	Mention different Public Enterprises	2M	CO4	L3
	g	What is Payback Period?	2M	CO5	L4
	h	What is Net Present Value (NPV)?	2M	CO5	L3
	i	What is a journal?	2M	CO6	L2
	j	Define trading account.	2M	CO6	L2
PART-B					
UNIT-I					
2	a	Evaluate the effectiveness of different methods of demand forecasting in predicting market trends.	10M	CO1	L3
OR					
3	a	Explain how would you forecast the demand forecasting a new product (product of your choice) in an emerging market.	10M	CO1	L3
UNIT-II					
4	a	The following information relates to XYZ company. Particulars | Amount in Rs Fixed cost | 72000 Variable cost per Unit | 15 Selling cost per Unit | 24 From the above find out. (i) Break-even point in terms of sales value and in units. (ii) Number of units that must be sold to earn a profit of Rs. 90,000.	10M	CO2	L3
OR					
5	a	Explain the concept of Production Function and describe the salient features of Cobb-Douglas production function.	10M	CO2	L3
UNIT-III					
6	a	Illustrate how the main features and organizational structure of a Joint Stock Company are applied in real business situations.	10M	CO3	L3
OR					
7	a	Analyze price-output to determination under monopoly.	5M	CO4	L3
	b	Discuss monopolistic competition and its features.	5M	CO4	L4
UNIT-IV					
8		An investment of $200,000 is expected to generate the following cash inflows in six years: $70,000 , $60,000 , $55,000, $40,000, $30,000, $25,000.Compute payback period of the investment. Should the investment be made if management wants to recover the initial investment in 3 years or less?	10M	CO5	L3
OR					

<table>
<tr><td>9</td><td>a</td><td>What is the importance of capital? What factors determine the working capital requirements of a company?</td><td>10M</td><td>CO4</td><td>L3</td></tr>
<tr><td colspan="6">UNIT-V</td></tr>
<tr><td>10</td><td>a</td><td>Transactions for a business named "Geetha & Co." for April 2025, followed by the correct journal entries.
<table>
<tr><th>Date (2025)</th><th>Particulars</th><th>Amount (₹)</th></tr>
<tr><td>Apr 1</td><td>Geetha commenced business with cash</td><td>50,000</td></tr>
<tr><td>Apr 2</td><td>Opened a bank account with SBI</td><td>20,000</td></tr>
<tr><td>Apr 3</td><td>Purchased goods for cash</td><td>14,000</td></tr>
<tr><td>Apr 4</td><td>Sold goods to Bhaskar on credit</td><td>12,000</td></tr>
<tr><td>Apr 5</td><td>Paid telephone bill by cheque</td><td>500</td></tr>
<tr><td>Apr 6</td><td>Goods returned by Bhaskar</td><td>1,000</td></tr>
</table></td><td>10M</td><td>CO6</td><td>L3</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>11</td><td>a</td><td>Apply the rules of accounting to record business transactions in the journal.</td><td>5M</td><td>CO6</td><td>L2</td></tr>
<tr><td></td><td>b</td><td>Describe how a Trading Account is prepared to find gross profit or loss.</td><td>5M</td><td>CO6</td><td>L3</td></tr>
</table>

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