Hall Ticket Number :										

R-19

Code: 19AC44T

II B.Tech. II Semester Supplementary Examinations April 2023

Life Sciences for Engineers

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) Describe is Nucleus? Write their structure and important functions and draw the labelled diagram? 7M

   b) Describe is mitochondrion? Write their structure and important functions and draw the labelled diagram? 7M

OR

2. a) Describe is Endoplasmic reticulum? Write their structure and important functions and draw the labelled diagram? 7M

   b) Explain the kingdom of Animalia? 7M

UNIT–II

3. Describe the structure of DNA & RNA? 14M

OR

4. Define the proteins? Write the structure and functions of proteins? 14M

UNIT–III

5. a) Explain the Oxidative phosphorylation? 7M

   b) What is neuron? Write their structure with draw the labelled diagram? 7M

OR

6. Explain the reaction of Electron Transport Chain? 14M

UNIT–IV

7. a) Briefly describe the transcription and translation? 7M

   b) Write the types of cell division and signifience of cell division? 7M

OR

8. a) Explain Mendel dihybrid cross experiment? 7M

   b) Describe the sequential steps in the replication of DNA? 7M

UNIT–V

9. a) Explain the Importance of DNA Cloning? 7M

   b) Discuss the application of Recombinant DNA Technology? 7M

OR

10. a) Describe the types of Biosensors? 7M

    b) Write short notes on restriction enzymes? 7M

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Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8=50, will be treated as malpractice.

Hall Ticket Number :										

R-19

Code: 19AC42T

II B.Tech. II Semester Supplementary Examinations April 2023

Numerical Methods and Transform Techniques

(Common to EEE &ECE)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.		Find the real root of $xe^x - \cos x = 0$ using Bisection Method	14M	CO1	L3
		OR			
2.	a)	Find the real root of $\cos x = xe^x$ using False position Method	7M	CO1	L3
	b)	Construct Newton's forward interpolating polynomial for the following data.			

x	4	6	8	10
y	1	3	8	16

7M CO1 L3

		UNIT–II					
3.	a)	Obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=1.2 from the following data					

x	1	1.2	1.4	1.6	1.8	2	2.2
y	2.7183	3.3201	4.1552	4.9530	6.0496	7.3891	9.0250

7M CO2 L3

	b)	Use Runge Kutta method to find y at x=0.1 given that $\frac{dy}{dx} = x + y$ and y=1 when x=0	7M	CO2	L3
		OR			
4.		Given $\frac{dy}{dx} = x^2 + y$, $y(0) = 1$. Determine y(0.02), y(0.04), y(0.06) by Modified Euler's method.	14M	CO2	L3
		UNIT–III			
5.	a)	Expand $f(z) = \frac{1}{z^2 - 3z + 2}$ in the region i) $0 < \lvert z-1 \rvert < 1$, ii) $1 < \lvert z \rvert < 2$	7M	CO3	L2
	b)	Evaluate $\oint_c \frac{dz}{(z^2+4)^2}$ where $c : \lvert z - i \rvert = 2$ using Cauchy Residue theorem.	7M	CO3	L2
		OR			
6.	a)	Find the Talor's series expansion of coshz about $z = ®i$	7M	CO3	L4
	b)	Determine the poles and residues at each pole of the function $f(z) = \frac{z+1}{z^2(z-2)}$	7M	CO3	L3
		UNIT–IV			
7.	a)	Using Fourier integral, show that $e^{-ax} = \frac{2a}{®} \int_0^\infty \frac{\cos ax}{a^2 + a^2} d$a	7M	CO4	L3
	b)	Find the Fourier transform of $f(x) = \begin{cases} 1, \lvert x \rvert < 1 \\ 0, \lvert x \rvert > 1 \end{cases}$ .and hence show that $\int_0^\infty \frac{\sin x}{x} dx = \frac{®}{2}$	7M	CO4	L1
		OR			
8.		Find the Fourier sine transform of $e^{-\lvert x \rvert}$	14M	CO4	L1
		UNIT–V			
9.		If $f(z) = \frac{2z^2 + 3z + 4}{(z-3)^3}$, $\lvert z \rvert > 3$ then find the values of f(1), f(2), f(3).	14M	CO5	L1
		OR			
10.		Find $Z^{-1}\left(\frac{z}{(z-1)(z^2+1)}\right)$	14M	CO5	L1

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Hall Ticket Number :										

R-19

Code: 19A443T

II B.Tech. II Semester Supplementary Examinations April 2023

Analog Communication Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.	a)	Summarize about the Elements of communication system	7M	1	5
	b)	Recall about the Need for modulation.	7M	1	2
		OR			
2.	a)	Show that the efficiency of Amplitude Modulation is 33.3%.	7M	1	3
	b)	A Broadcast AM transmitter radiates 50KW of carrier power, what will be the radiated power at 85% of modulation and also find total sideband power?	7M	1	4
		UNIT–II			
3.	a)	Explain demodulation of FM using first order PLL?	7M	2	2
	b)	Describe the frequency spectrum of WBFM with required expressions.	7M	2	2
		OR			
4.	a)	Discuss about the direct method of FM generation with neat sketches?	7M	2	2
	b)	The FM signal has a sinusoidal modulation frequency 20KHz and a modulation index β=4. Find the transmission bandwidth of FM using Carson's rule.	7M	2	3
		UNIT–III			
5.	a)	Recall the noise performance of AM systems	7M	3	1
	b)	Discuss about the noise in Angle Modulation System and its SNR Calculation.	7M	3	2
		OR			
6.	a)	Explain the noise performance of AM system.	7M	3	2
	b)	Explain about the threshold effects in FM system?	7M	3	2
		UNIT–IV			
7.	a)	Analyze AM transmitters with modulation at high carrier power level.	7M	4	4
	b)	Discuss different alignment and tracking techniques in the radio receivers?	7M	4	2
		OR			
8.	a)	Explain about the working principle of FM Receiver.	7M	4	2
	b)	List out the carrier frequency requirements in a radio transmitter.	7M	4	1
		UNIT–V			
9.	a)	Discuss about the generation of double polarity PAM and its generation.	6M	5	2
	b)	Explain about the concept of PPM signal generation.	8M	5	2
		OR			
10.	a)	Discuss about Frequency Division Multiplexing	8M	5	2
	b)	Explain the generation of PPM signal.	6M	5	2

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Hall Ticket Number :										

R-19

Code: 19A441T

II B.Tech. II Semester Supplementary Examinations April 2023

Analog IC Applications

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.		Discuss the DC characteristics of an Op Amp.	14M	CO1	L2
		OR			
2.	a)	Explain the power supply connections of op-amp.	7M	CO1	L2
	b)	Define IC and list the applications of ICs.	7M	CO1	L1
		UNIT–II			
3.	a)	Design an adder circuit using Op-Amp to get output voltage $V_o=(0.1V_1+V_2+10V_3)$. Consider V_1, V_2, V_3 are input voltages.	7M	CO2	L6
	b)	Illustrate the operation of non-inverting summer circuit using IC 741.	7M	CO2	L3
		OR			
4.	a)	Discuss the operation of basic differentiator circuit using op-amp	7M	CO2	L2
	b)	Consider the lossy integrator with components R_1=10 KΩ, R_F=100 KΩ, C_F=10nF. Determine the lower frequency limit of integrator.	7M	CO2	L3
		UNIT–III			
5.	a)	Discuss the operation of Log Amplifier.	7M	CO3	L2
	b)	Demonstrate the operation of Precision Full-wave Rectifier.	7M	CO3	L3
		OR			
6.	a)	Explain how astable multivibrator can be used as Square wave generator.	9M	CO3	L4
	b)	Design an astable multivibrator for output frequency of 1KHz	5M	CO3	L6
		UNIT–IV			
7.	a)	Draw and Explain the operation of Schmitt trigger using IC555.	7M	CO4	L2
	b)	Demonstrate how a PLL can be used as Frequency Multiplier.	7M	CO4	L3
		OR			
8.		Illustrate the operation of monostable multivibrator circuit using IC 555 and derive the expression for time period	14M	CO4	L3
		UNIT–V			
9.	a)	Illustrate the operation of weighted resistor DAC.	7M	CO5	L3
	b)	Discuss the operation of Servo tracking ADC.	7M	CO5	L2
		OR			
10.		Discuss the drawbacks of R-2R ladder DAC and explain the operation of Inverted R-2R DAC.	14M	CO5	L2

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Hall Ticket Number :										

R-19

Code: 19A442T

II B.Tech. II Semester Supplementary Examinations April 2023

Control Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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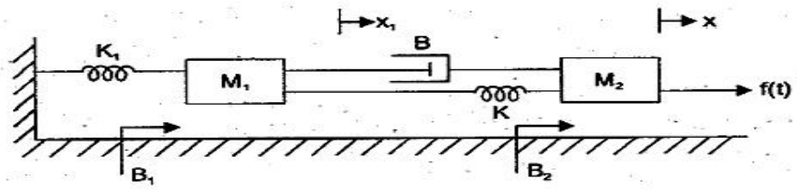
			Marks	CO	BL
		UNIT–I			
1.	a)	For the mechanical system given below write differential equations and find the transfer function 	8M	CO1	L1
	b)	Compare open loop and closed loop control systems	6M	CO1	L5
		OR			
2.	a)	Explain the feedback characteristics of closed loop control system	7M	CO1	L2
	b)	Define closed loop control systems with two examples	7M	CO1	L1
		UNIT–II			
3.		For servomechanisms with open loop transfer function given below explain what type of input signal give rise to a constant steady state error and calculate their values a) G(s)=20(s+2)/s(s+1)(s+3) b) G(s)=10/(s+2)(s+3) c) G(s)=10/s^2(s+1)(s+2)	14M	CO2	L3
		OR			
4.	a)	Discuss about procedural steps to sketch root locus	7M	CO3	L2
	b)	Find the breakaway point and angle of departure of a unity feedback system has open loop transfer function G(s)= K/s(s^2+4s=13)	7M	CO3	L2
		UNIT–III			
5.	a)	The open loop transfer function of a unity feedback system is given by G(s)= 1/s^2(1+s)(1+2s) Sketch the polar plot and determine the gain margin and phase margin	10M	CO3	L4
	b)	Distinguish between gain margin and phase margin	4M	CO3	L2
		OR			
6.		Define the following terms (i) Gain cross over frequency (ii)Phase cross over frequency (iii) Gain margin (iv)Phase margin	14M	CO3	L1
		UNIT–IV			
7.		A unity feedback system has an open loop transfer function G(s)=K/s(1+2s) Design a suitable lag compensator so that the phase margin is 40^0 and the steady state error for ramp input is less than or equal to 0.2	14M	CO4	L6
		OR			
8.	a)	Explain PID controller and discuss the effect on the behavior of the system	10M	CO4	L2
	b)	Define Integral Controller	4M	CO4	L1
		UNIT–V			
9.		Develop the state vector x(t) for the state model $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}-12 & 2/3\\ -36 & -1\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}+\begin{bmatrix}1/3\\ 1\end{bmatrix}u;$ and the initial conditions are $X_1(0)=2$, $X_2(0)=1$	14M	CO5	L6
		OR			
10.	a)	Obtain the state model for the system represented by $\frac{d^3y}{dt^3}+6\frac{d^2y}{dt^2}+11\frac{dy}{dt}+10y=3u(t).$	7M	CO5	L3
	b)	Determine the state transition matrix of the state matrix $A=\begin{bmatrix}0 & 1\\ -1 & -2\end{bmatrix}.$	7M	CO5	L3

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Hall Ticket Number :										

R-19

Code: 19A444T

II B.Tech. II Semester Supplementary Examinations April 2023

Field Theory and Transmission Lines

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL
		UNIT–I			
1.	a)	Analyze the relation between E and V	7M	CO1	L4
	b)	Recite divergence theorem	7M	CO1	L1
		OR			
2.		State Gauss law. What are the conditions required for setting up a Gaussian surface. Apply Gauss law to calculate electric field due to Infinite line Charge.	14M	CO1	L2
		UNIT–II			
3.	a)	List and explain the steps to determine Resistance	7M	CO2	L2
	b)	Infer the formula for series resistance	7M	CO2	L4
		OR			
4.	a)	Differentiate between resistance and capacitance	7M	CO2	L3
	b)	Write a short note on Convection current	7M	CO2	L2
		UNIT–III			
5.	a)	Derive Ampere Circuits Law with related equations	7M	CO3	L3
	b)	Write the applications of Amperes circuits law	7M	CO3	L2
		OR			
6.	a)	Discuss on Motional EMF	7M	CO3	L2
	b)	Summarize Maxwell's equations for Static EM fields	7M	CO3	L2
		UNIT–IV			
7.	a)	Discuss about pointing theorem and Poynting vector.	7M	CO4	L2
	b)	calculate the α and β equations in wave propagation	7M	CO4	L3
		OR			
8.	a)	Explain and derive the characteristics of wave propagation in free space.	7M	CO4	L2
	b)	Compare between lossy and lossless wave propagation	7M	CO4	L2
		UNIT–V			
9.	a)	Outline Propagation Constant in transmission lines	7M	CO5	
	b)	Calculate the characteristic impedance by using the following parameters of the line R =65ohms/km L = 1.6mH/km C = 0.1 μF/km G = 2.25μΩ/km	7M	CO5	L3
		OR			
10.	a)	Explain the applications of transmission lines.	7M	CO5	L2
	b)	What is the relationship between primary constants and secondary constants of a transmission line?	7M	CO5	L2

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