Hall Ticket Number :										

R-19

Code: 19A444T

II B.Tech. II Semester Supplementary Examinations May/June 2024

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)	Restate and explain Coulomb's law? Obtain an expression of it in vector form.	7M	CO1	L2
	b)	Point charges 5nC and -2nC are located at (2, 0, 4) and (-3,0,5) respectively. i) Determine the force on a 1nC point charge located at (1,-3,7) ii) Find the electric field E at (1,-3,7)	7M	CO1	L4
		OR			
2.	a)	Explain different types of coordinates systems	7M	CO1	L2
	b)	Recall stokes theorem and write its equation	7M	CO1	L1
		UNIT–II			
3.	a)	Elaborate Polarization in Dielectrics	7M	CO2	L3
	b)	Label the concept of conductors	7M	CO2	L1
		OR			
4.	a)	Define Linear, Isotropic and Homogeneous Dielectrics	7M	CO2	L1
	b)	Identify the convection and conduction currents	7M	CO2	L1
		UNIT–III			
5.	a)	Analyze the Magnetic Flux density	7M	CO3	L3
	b)	Explain Biot-Savart's Law.	7M	CO3	L2
		OR			
6.	a)	Derive Ampere Circuits Law with related equations	7M	CO3	L3
	b)	Write the applications of Amperes circuits law	7M	CO3	L2
		UNIT–IV			
7.		Derive α , β and explain waves propagation in lossy dielectrics	14M	CO4	L4
		OR			
8.	a)	Define an em wave and briefly explain waves in general	7M	CO4	L1
	b)	Compare the propagation of waves in Lossy and lossless dielectrics	7M	CO4	L3
		UNIT–V			
9.		Derive Transmission line equation in terms of voltage and current	14M	CO5	L4
		OR			
10.	a)	What is a Transmission Line? Label different types of transmission lines?	7M	CO5	L1
	b)	Explain transmission line primary parameters	7M	CO5	L2

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Hall Ticket Number :										

R-19

Code: 19AC42T

II B.Tech. II Semester Supplementary Examinations May / June 2024

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.	a)	Find the real root of $x^3 - 2x - 9 = 0$ using Newton Raphson Method	7M	CO1	L3
	b)	Find the cubic polynomial which takes the following values			

x	0	1	2	3
Y	1	2	1	10

7M CO1 L1

OR

2.	a)	Find the real root of $3x = \cos x + 1$ using Newton Raphson Method	7M	CO1	L3
	b)	Calculate the value of f(7.5) from the following data			

x	1	2	3	4	5	6	7	8
f(x)	1	8	27	64	125	216	343	512

7M CO1 L3

UNIT–II

3.	a)	Compute $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at x=1 from the following data.						

x	1	2	3	4	5	6
y	1	8	27	64	125	216

7M CO2 L3

b) Solve $\frac{dy}{dx} = x + y^2$, $y(1) = 0$ to find y at x=0.2 by Runge-Kutta method of fourth order. 7M CO2 L3

OR

4. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at i)x=1.1 ii)x=1.6

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

14M CO2 L1

UNIT–III

5. Expand $f(z) = \frac{1+2z}{z^2 + z^3}$ in a series of +ve and –ve powers of z 14M CO3 L2

OR

6. Obtain the Taylor's series expansion of $f(z) = \frac{e^z}{z(z+1)}$ about z=2 14M CO3 L3

UNIT–IV

7. Find the finite fourier sine and cosine transform of $f(x)=\begin{cases}1, 0<x<\frac{®}{2}\\ -1, \frac{®}{2}<x<®\end{cases}$ 14M CO4 L1

OR

8. Solve the integral equation $\int_0^{\infty} f(\bar{}) \cos \sim \bar{} d\bar{} = \begin{cases}1-\sim, 0 \le \sim \le 1\\ 0, \sim > 1\end{cases}$ and hence evaluate $\int_0^{\infty} \frac{\sin^2 t}{t^2} dt$ 14M CO4 L3

UNIT–V

9. Show that $Z\left(\frac{1}{n!}\right) = e^{\frac{1}{z}}$ and hence evaluate $Z\left(\frac{1}{(n+1)!}\right)$ and $Z\left(\frac{1}{(n+2)!}\right)$ 14M CO5 L2

OR

10. Find $Z^{-1}\left(\frac{4z^2-2z}{z^3-5z^2+8z-4}\right)$ 14M CO5 L1

END

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R-19

Code: 19A443T

II B.Tech. II Semester Supplementary Examinations May/June 2024

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)	Explain about the detection of DSB-SC signal.	7M	1	2
	b)	Describe the detection method of SSB-SC.	7M	1	2
		OR			
2.	a)	Derive the expressions of various power calculations involved in AM.	7M	1	6
	b)	Describe the frequency spectrum of AM with relevant expressions.	7M	1	2
		UNIT–II			
3.	a)	A single tone FM signal is given by $S(t)= 10\cos(2\pi X10^6t+20\sin2\pi X10^3t)$ Find the modulation index, modulating frequency, deviation, carrier frequency, and the power of the FM signal.	8M	2	3
	b)	Explain with suitable diagram, how the Wide band FM signal can be generated.	6M	2	2
		OR			
4.	a)	Explain about the block diagram of Indirect method of FM with its working principle.	10M	2	2
	b)	Compare between FM and AM.	4M	2	5
		UNIT–III			
5.	a)	Show that the FOM of a DSBSC system is unity.	7M	3	3
	b)	Determine the SNR for SSB-SC signal. Consider white input noise	7M	3	3
		OR			
6.	a)	Compare AM and FM by considering noise.	7M	3	5
	b)	Discuss the role of pre-emphasis and de-emphasis in commercial FM.	7M	3	2
		UNIT–IV			
7.	a)	Explain about Tuned Radio Frequency receiver.	8M	4	2
	b)	Classify the radio transmitters based on type of modulation and service involved.	6M	4	4
		OR			
8.	a)	Outline the working principle of TRF receiver with neat sketches.	8M	4	4
	b)	Explain about the functions of each block in high level AM transmitter?	6M	4	2
		UNIT–V			
9.	a)	Describe how an audio signal can be sent using TDM.	8M	5	2
	b)	Differentiate between PAM and PWM.	6M	5	2
		OR			
10.	a)	Describe the scheme of generation of PAM signals with neat sketches.	6M	5	2
	b)	Summarize the working principle of Frequency division multiplexing?	8M	5	2

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