Hall Ticket Number :										

R-19

Code: 19AC31T

II B.Tech. I Semester Supplementary Examinations June 2024

Partial Differential Equations and Complex Variables

(Common to CE, EEE, ME & 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 $L\left\{\frac{e^{-at}-e^{-bt}}{t}\right\}$	7M	CO1	L1
	b)	Find $L\left\{\frac{1-e^{t}}{t}\right\}$	7M	CO1	L1
		OR			
2.	a)	Find the Laplace Transform of $e^{2t}+4t^3-2\sin 3t+3\cos 3t$	7M	CO1	L1
	b)	Find the L.T of $\left(t^2+1\right)^2$	7M	CO1	L1
		UNIT–II			
3.		Using L.T, solve the differential equation $\frac{d^2y}{dt^2}+2\frac{dy}{dt}+5y=e^{-t}\sin t$, Given that $Y(0)=0, Y'(0)=1$	14M	CO2	L3
		OR			
4.	a)	Find $L^{-1}\left\{\frac{3\left(s^2-2\right)^2}{2s^5}\right\}$	7M	CO2	L1
	b)	Find the inverse L.T of $\frac{4}{(s+1)(s+2)}$	7M	CO2	L1
		UNIT–III			
5.		Obtain the Fourier cosine series for $f(x)=x\sin x,\ 0<x<®$ and Show that $\frac{1}{1.3}-\frac{1}{3.5}+\frac{1}{5.7}-\frac{1}{7.9}+\text{--------}=\frac{®-2}{4}$.	14M	CO3	L3
		OR			
6.		Express $f(x)=x-®$ as Fourier series in the interval $-®<x<®$	14M	CO3	L2
		UNIT–IV			
7.		Solve $\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2}=0$ with $u(0,y)=0=u(x,0),\ u(l,y)=0\ \ and\ \ u(x,a)=\sin\left(\frac{n®x}{l}\right)$	14M	CO4	L3
		OR			
8.		Solve by the method of separation of variables $\frac{\partial^2 z}{\partial x^2}=\frac{\partial z}{\partial y}+2z$	14M	CO4	L3
		UNIT–V			
9.		Evaluate $\int_c \frac{z^3-\sin 3z}{\left(z-\frac{®}{2}\right)^3}dz$ *with* $C:\lvert z\rvert=2$ using Cauchy's integral formula.	14M	CO5	L5
		OR			
10.		Prove that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)\lvert Real\ f(z)\rvert^2=2\lvert f'(z)\rvert^2$ where $w=f(z)$ is analytic.	14M	CO5	L5

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Hall Ticket Number :										

R-19

Code: 19A434T

II B.Tech. I Semester Supplementary Examinations June 2024

Signals & 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

UNIT–I

1. a) Explain the various operations on signals 7M

   b) Find the even and odd components of the following signal x(t) = cost + sint +2sint+4cost 7M

OR

2. a) Define Fourier series of signal f(t) .Derive the Relationship between various types of Fourier series representation 7M

   b) State and prove convolution property in Fourier series. 7M

UNIT–II

3. a) State and prove Differentiation and integration properties of Fourier Transform. 7M

   b) Obtain the Fourier transform of a periodic train of impulses with period T. 7M

OR

4. Define Fourier transform. Explain the properties of Fourier transform 14M

UNIT–III

5. a) Differentiate LTI system with LTV system. 7M

   b) State and prove the sampling theorem for a band limited signals 7M

OR

6. a) State and derive the relationship between bandwidth and rise time. 7M

   b) Discuss about the Causality and physical reliability of a system. 7M

UNIT–IV

7. a) Explain the relation between convolution and correlation. 7M

   b) With an example explain the Graphical representation of convolution. 7M

OR

8. Find the graphical convolution between following signals

   x(t)=1 for 0≤t≤2 and h(t)=1 for 0≤t≤3

   0 otherwise 0 otherwise 14M

UNIT–V

9. a) Derive the relation between Z transform and Fourier transform 7M

   b) Find the inverse of Z transform of $X(Z) = Z / (3Z^2 - 4Z+1)$. 7M

OR

10. a) Explain the constraints on ROC for various classes of signals 7M

    b) Give the relationship between z-transform ,Fourier transform and Laplace Transform 7M

END

Hall Ticket Number :										

R-19

Code: 19A431T

II B.Tech. I Semester Supplementary Examinations June 2024

Electronic Circuits

(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
		UNIT–I	
1.	a)	Compare various coupling schemes used in amplifiers.	8M
	b)	Derive the expressions of Millers theorem and its dual.	6M
		OR	
2.	a)	With a neat diagram, explain in detail about the operation of direct and transformer coupled amplifiers	7M
	b)	Draw and explain the circuit of cascaded amplifier and mention the advantages	7M
		UNIT–II	
3.	a)	What is the significance of 3dB bandwidth?	7M
	b)	What are half power frequencies?	7M
		OR	
4.	a)	With hybrid π equivalent circuit, derive the expressions for trans conductance.	6M
	b)	Explain the frequency response of amplifier at Low, Mid and High frequencies	8M
		UNIT–III	
5.	a)	What is the impact of negative feedback on bandwidth? If an amplifier with gain of A = 1000 and feedback of β = 0.1 has a gain change of 20% due to temperature, calculate the change in gain of the feedback amplifier if negative feedback is introduced.	10M
	b)	Why positive feedback is not suitable in amplifiers.	4M
		OR	
6.	a)	Write about Classification of feedback amplifiers,	7M
	b)	Briefly discuss about the effect of feedback on amplifier bandwidth	7M
		UNIT–IV	
7.	a)	What are the features and advantages of crystal oscillator?	7M
	b)	List out the types of oscillators.	7M
		OR	
8.	a)	A wein bridge oscillator has a frequency of 400Hz, if the value of C is 100pF then determine the value of R.	7M
	b)	With neat diagram explain about amplitude stability of oscillators.	7M
		UNIT–V	
9.	a)	Derive the maximum efficiency of a transformer coupled class A Power amplifier.	7M
	b)	Explain class B push-pull amplifier operation with neat diagrams.	7M
		OR	
10.	a)	Explain Advantages, disadvantages and applications of tuned amplifiers	7M
	b)	Give the classification of large signal amplifiers	7M

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