

## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
01	20-06-22	9.00-10.00	Introduction & Discussion of Syllabus.
02	24-06-22	11.30-12.30	<u>Unit-I</u> : Differential Eq <sup>s</sup> of Higher Order Basic Def <sup>s</sup>
03	25-06-22	9.00-10.00	Homogeneous & Linear non-homogeneous CDE & Solution of C.F & Problems.
04	27-06-22	9.00-10.00	Method of finding P.I: $\frac{e^{ax}}{f(D)}$ & Examples
05	30-06-22	2.30-3.30	P.I of $\frac{\sin ax}{f(D)}$ or $\frac{\cos ax}{f(D)}$ & Problems.
06	30-06-22	3.30-4.30	P.I of $\frac{\text{Polynomial in } x}{f(D)}$ & Examples.
07	01-07-22	11.30-12.30	P.I of $\frac{e^{ax} \cdot v}{f(D)}$ & Problems.
08	02-07-22	9.00-10.00	P.I of $\frac{x \cdot v}{f(D)}$ & $\frac{x^2 \sin ax}{f(D)}$ or $\frac{x^2 \cos ax}{f(D)}$ & Exs.
09	04-07-22	9.00-10.00	Contd. (Tutorial)
10	05-07-22	10.30-11.30	Mixed type of Examples.
11	08/07/22	11.30-12.30	Method of variation of Parameters and problems.
12	09/07/22	9-10	Legendre's linear diff. eq <sup>n</sup> and problems
13	11/07/22	9-10	Application of diff eq <sup>n</sup> on: circuits problems
14	11/07/22	2-30-3-30	Simple pendulum, and Spring pblms. (Tutorial)
15	11/07/22	3-30-4-30	Remedial class: Revision for above topics.
16	12/07/22	12.30-1.30	<u>Unit-II</u> : Partial diff Equation, Introduction PDE by eliminating arb. constants.
17	13/07/22	11.30-12.30	By eliminating arb. functions.
18	16/07/22	9-10	Solve the problems on above topic
19	18/07/22	9-10	Revision for above topic (Tutorial)
20	22/07/22	11.30-12.30	IA-I Answer paper shown and discussion

## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
21	25/07/22	9-10	Method of Separation of Variables
22	28/07/22	9-10	Derivation of wave Equation
23	29/07/22	11-30-12-30	Soln of wave eqn and problems
24	01/08/22	9-10	Some more problems on wave eqn. (Tutorial)
25	05/08/22	10.30-11.30	<u>Unit-III</u> : Laplace Transform (L.T): Introduction, Defn and properties
26	05/8/22	11-30-12-30	L.T of Elementary function & problem
27	06/8/22	9-10	L.T of multiple of $t$ , division by $t$ & problems
28	6/8/22	10.30-11.30	L.T of derivative and integrals & problems
29	8/8/22	9-10	L.T of Periodic function and problems.
30	13/8/22	9-10	Unit Step function: Defn, properties.
31	13/8/22	10.30-11.15	problems on Unit step function (Tutorial)
32	16/8/22	12.30-1.30	<u>Unit-IV</u> : Inverse Laplace Transforms (ILT) Introduction, Defn, Table of ILT.
33	19/8/22	11.30-12.30	problems on ILT (Discussion)
34	20/8/22	9-10	problems on ILT of $e^{as} f(s)$
35	21/8/22	9-10	Introduction about Geogebra and <sup>their</sup> applications.
36	27/8/22	9-10	problems on ILT (log functions) (Tutorial)
37	29/8/22	9-10	Showing IIA Books and Discuss <del>***</del>
38	03/9/22	9-10	Convolution thm & problems
39	05/9/22	9-10	Some more problems and application of (Tutorial) I on D.E
40	09/9/22	10.30-11.30	problems on I.L.T and Conducting Surprise Test



## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
01	8/6/22	9.00-10.00	syllabus discussion UNIT-I- Introduction of $n$ th order D.E.
02	9/6/22	8.00-9.00	solution of homogeneous linear D.E.
03	12/6/22	11.30-12.30	Problems
04	15/6/22	9.00-10.00	P.I of the form $e^{ax}$
05	16/6/22	8.00-9.00	P-I of the form $\sin ax$ or $\cos ax$
06	17/6/22	10.30-11.30	P-I of the form $x^n$ or polynomial (Tutorial)
07	22/6/22	9.00-10.00	P-I. of the form $e^{ax}v$
08	23/6/22	8.00-9.00	P-I of the form $xv$
09	28/6/22	11.30-12.30	$x^2$ or $x$ or $\ln x$ or problems
10	29/6/22	11.30-12.30	soln of D.E by method of variation of parameters
11	30/6/22	8.00-9.00	Problems of LDE with variable coefficients.
12	1/7/22	10.30-11.30	Legendre's LDE & problems
13	9/7/22	11.30-12.30	Application of D.E in electric circuits (Tutorial)
14	6/7/22	9.00-10.00	Application of D.E in oscillation of spring
15	7/7/22	8.00-9.00	UNIT-II: Introduction of PDE & formation of PDE by eliminating const
16	8/7/22	10.30-11.30	Formation of PDE by eliminating arbitrary fns
17	12/7/22	11.30-12.30	Problems
18	13/7/22	9.00-10.00	Formation of PDE $\phi(u, v) = 0$ & introduction of soln of PDE by method of separation of variables
19	14/7/22	8.00-9.00	Problems on method of separation of variables.
20	26/7/22	10.30-11.30	Problems continued Tutorial

## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
21	26/7/22	11:30-12:30	Application of PDE: derivation of one dimensional wave eqn.
22	27/7/22	9:00-10:00	derivation of one dimensional heat eqn → soln of wave eqn by method of separation of variables
23	28/7/22	8:00-9:00	Problems on wave eqn
24	2/8/22	10:30-11:30	Problems on heat eqn & Tutorial
25	2/8/22	11:30-12:30	Unit-III: Laplace transfrom, properties of L.T.
26	3/8/22	9:00-10:00	L.T. of std. functions
27	4/8/22	8:00-9:00	Problems
28	8/8/22	10:30-11:30	Problems & L.T of multiplication
29	9/8/22	10:30-11:30	L.T. of division & <del>multiplication</del> integral
30	9/8/22	11:30-12:30	Problems
31	11/8/22	8:00-9:00	Problems (Tutorial)
32	16/8/22	10:30-11:30	L.T of periodic functions
33	16/8/22	11:30-12:30	Problems
34	17/8/22	9:00-10:00	L.T of unit step function
35	17/8/22	12:00-1:00	Problems
36	23/8/22	10:30-11:30	Doubts cleared on PDE & L.T Tutorial
37	23/8/22	11:30-12:30	
38	1/9/22	9:00-10:00	Unit-IV: Inverse L.T of std fns & problems
39	6/9/22	11:30-12:30	Inverse L.T by partial fraction
40	7/9/22	9:00-10:00	Problems (i.e. Inverse by completing square)



## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
01	08/06/22	9 to 10 AM	Unit-I: Differential Equations of Higher Order: Introduction.
02	14/06/22	11-30 to 12-30 PM	Basics of DE and Examples on C.F
03	15/06/22	9 to 10 AM	Examples on C.F
04	16/06/22	11-30 to 12-30 PM	Examples on P.I of type-1
05	18/06/22	10-30 to 11-30 AM	Examples on P.I of type-2
06	20/06/22	10-30 to 11-30 AM	Examples on P.I of type-3
07	22/06/22	9 to 10 AM	Examples on P.I of type-4
08	23/06/22	11-30 to 12-30 PM	Examples on P.I of type-5 and Mixed type problems
09	27/06/22	10-30 to 11-30 AM	Method of Variation of Parameters and Examples
10	28/06/22	9 to 10 AM	Legendre's DE and Examples.
11	02/07/22	8 to 9 AM	Applications of DE to L-C-R Series Circuits.
12	04/07/22	10-30 to 11-30 AM	Examples on Applications of DE.
13	06/07/22	9 to 10 AM	Examples on DE & Revision of Unit I.
14	07/07/22	10-30 to 11-30 AM	Unit-II: Partial Differential Equations Introduction, Examples on Formation of PDE.
15	09/07/22	8 to 9 AM	Example on Formation of PDE by eliminating Functions
16	11/07/22	10-30 to 11-30 AM	Examples on Formation of PDE and Revision of IA-I Syllabus.
17	12/07/22	2-30 to 3-30 PM	Remedial Class: Revision on Unit-I and Unit-II upto PDE Formation basics.
18	12/07/22	3-30 to 4-30 PM	Introduction to Geogebra and Solution of PDE by Variable Separable Method and Examples.
19	13/07/22	9 to 10 AM	Applications of PDE: Derivation of one Dimensional wave & Heat Equations.
20	14/07/22	11-30 AM to 12-30 PM	



## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
21	16/07/2022	8 to 9 AM	Solution of Wave Equation by Separation of Variables Method.
22	18/07/2022	10-30 AM TO 11-30 AM	Problems on one-Dimensional Wave Equation and Revision of IA-I syllabus.
23	23/07/22	8 to 9 AM	Problems on one-Dimensional Wave Equation.
24	25/07/22	10-30 AM TO 11-30 AM	Revision on unit-II Unit-III : Laplace Transforms: Introduction
25	27/07/22	9 AM TO 10 AM	Definition and properties of Laplace Transforms
26	30/07/22	8 AM TO 9 AM	Laplace Transforms of some Standard Functions.
27	01/08/22	10-30 AM TO 11-30 AM	Elementary Examples on L-T.
28	01/08/22	11-30 AM TO 12-30 PM	Examples on Laplace Transforms.
29	03/08/22	12-30 PM TO 1-30 PM	Examples on Laplace Transforms based on standard Results.
30	04/08/22	11-30 AM TO 12-30 PM	Examples on Laplace Transforms
31	06/08/22	8 AM TO 9 AM	Examples on Laplace Transforms
32	08/08/22	10-30 AM TO 11-30 AM	Examples on Laplace Transforms & Definition of Unit step function.
33	08/08/22	11-30 AM TO 12-30 PM	Properties of unit-step functions.
34	10/08/22	9 AM TO 10 AM	Examples on unit step function
35	13/08/22	8 AM TO 9 AM	Examples on Unit step Functions and Revision of Unit-II
36	20/08/22	8 AM TO 9 AM	Unit-IV : Inverse Laplace Transforms. Definition, elementary Examples.
37	22/08/22	10-30 AM TO 11-30 AM	Examples on Partial Fraction Method and Revision on IA-II syllabus.
38	27/08/22	8 AM TO 9 AM	Examples on Inverse Laplace Transforms & IA-II Result Discussion.
39	29/08/22	10-30 AM TO 11-30 AM	Examples on Inverse Laplace Transforms.
40	01/09/22	11-30 AM TO 12-30 PM	Examples on Inverse Laplace Transforms.



## SYLLABI COVERAGE DETAILS

Class No	Date	Time	Topic Covered
01	14.06.22	9.00-10.00	Introduction & Discussion of Syllabus
02	15.06.22	8.00-9.00	Unit-1: DE of Higher Order: Basic Concepts & DE. Order, Order, etc. etc. CDE with constant coefficients.
03	17.06.22	10.30-11.00	Homogeneous & also Homogeneous.
04	21.06.22	9.00-10.00	Homogeneous CDE: Method of Finding C.F. & Problems.
05	22.06.22	8.00-9.00	also Homogeneous CDE: Method of Finding P.I. of $E^{ax}/f(x)$ & Problems.
06	23.06.22	10.30-11.30	P.I. of $\frac{\cos ax}{f(x)}$ or $\frac{\sin ax}{f(x)}$ & Examples.
07	24.06.22	9.00-10.00	P.I. of $\frac{Poly in x}{f(x)}$ & Problems.
08	29.06.22	8.00-9.00	Contd. (Tutorial)
09	01.07.22	10.30-11.30	P.I. of $\frac{e^{ax}}{f(x)}$ & Examples.
10	04.07.22	2.30-3.30	P.I. of $\frac{x^n}{f(x)}$ & Problems.
11	05.07.22	9.00-10.00	Contd. (T)
12	06.07.22	8.00-9.00	Method of Variation of Parameters: Procedure & Examples.
13	08.07.22	10.30-11.30	Contd. & Lagrange's D.E.: 1st Eq. & Method of solving & Problems.
14	10.07.22	2.30-3.30	Contd. & Applications of ODE
15	12.07.22	9.00-10.00	Contd. (Tutorial)
16	12.07.22	2.30-3.30	Unit-2 Partial Differential Eq. (PDE) Basic Def. & Order of PDE by determining arbitrary functions.
17	13.07.22	8.00-9.00	Formation of PDE by eliminating arbitrary functions.
18	15.07.22	9.00-10.00	Forming PDE from $\phi(x,y,z)=0$ . method & Examples.
19	22.07.22	9.00-10.00	Chapter 12-1 Examples & Discussion of questions & Sol. of PDE by 1st order & Examples.
20	25.07.22	2.30-3.30	Examples of MSV & Tutorial



## SYLLABI COVERGAE DETAILS

Sl. No.	Date	Time	Topic Covered
1	22/09/22	9:00-10:00	Contd. of Wave & Heat eq <sup>n</sup> & Derivation of Wave eq <sup>n</sup>
2	23/09/22	9:30-11:00	Contd. & Derivation of Heat eq <sup>n</sup>
3	23/09/22	2:00-3:00	Sol <sup>n</sup> of wave eq <sup>n</sup> & BVP Problems.
4	23/09/22	9:00-10:00	Contd. & Tutorial
5	01/10/22	9:00-10:00	BVP's of Heat eq <sup>n</sup> & Unit-III: Laplace Transform (LT): Def <sup>n</sup> & Ex <sup>s</sup> of Circuit fu <sup>n</sup>
6	01/10/22	2:00-3:00	Contd. & LT of Elementary function
7	01/10/22	9:00-11:00	Examples of LT & Property-1: LT of f'(t) & Problems.
8	02/10/22	9:00-11:00	Property-2: LT of f''(t) & Problems.
9	02/10/22	11:00-12:00	LT of $\frac{f(t)}{t}$ Proof & Examples & Evaluation of integral using LT
10	03/10/22	2:00-3:00	Contd. of $\int_0^t f(t-\tau)g(\tau) d\tau$ Proof & Based on this examples. (Tutorial)
11	04/10/22	9:00-10:00	LT of periodic fu <sup>n</sup> : Proof & Examples of LT of $\int_0^t f(t-\tau)g(\tau) d\tau$ contd.
12	05/10/22	11:00-12:00	Problems on LT of periodic fu <sup>n</sup> .
13	05/10/22	9:00-11:00	Contd. of Unit-step function: Def <sup>n</sup> , Properties & Problems.
14	06/10/22	2:00-3:00	Examples contd. (Tutorial)
15	07/10/22	2:00-3:00	Unit-IV: Inverse LT: Def <sup>n</sup> & Examples Inverse LT of $e^{at} f(t)$
16	08/10/22	9:00-10:00	Contd. & Inverse LT of completing this separate.
17	09/10/22	2:00-3:00	Examples contd. (Tutorial)
18	10/10/22	9:00-10:00	Inverse LT by the method of Partial Fractions - Examples.
19	11/10/22	2:00-3:00	Contd. & Inverse LT of log & Inverse function
20	12/10/22	9:00-10:00	Examples contd. & Inverse LT of $\frac{f(s)}{s}$



## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
01	8/6	8-9	Introduction
02	18/6	10.30-11.30	Higher Order Differential eqn Defined I.A-1,2,3, CTA syllabus
EXH (03)	18/6	3.30-4.30	$\phi(0)y = 0$ Examples
04	20/6	10.30-11.30	Examples on $\phi(0)y = 0$
05	22/6	8-9	$\phi(x)y = f(x)$ , $e^{ax}$ , sinh or cosh examples
06	25/6	11.30-12.30	Examples (T)
07	27/6	10.30-11.30	$f(x) = x^m$ examples
08	29/6	11.30-12.30	Case (iv) & case (v) examples
T (09)	30/6	2.30-3.30	Legendre's eqn & Electric ckt.
10	2/7	10.30-12.00	Applications LCR, simple pendulum
11	W/6	10.30-11.30	Applications (T)
12	6/7	8-9	Method of variation of parameters
EXH (13)	7/7	9-10	Unit-II PDE formation
14	9/7	11.30-12.30	PDE formation
15	11/7	10.30-11.30	Examples
16	12/7	10.30-11.30	Examples on I.A-1 portion (T)
17	13/7	8-9	Examples
18	16/7	11.30-12.30	Method of separation of variables
19	18/7	10.30-11.30	Examples
20	25/7	10.30-11.30	Wave eqn & heat eqn



## SYLLABI COVERGAE DETAILS

Class No	Date	Time	Topic Covered
21	27/7	8-9	Problems
22	27/7	2.30-3.30	Boundary value problems (T)
23	27/7	3.30-4.30	Laplace Transform & elementary
24	1/8	10.30-11.30	Laplace properties and examples
25	3/8	8-9	Laplace transform property and problems
26	3/8	9-10 Eg	Laplace transform of integral and examples (T)
27	4/8	8-9 9-10	L.T. of periodic function & problems
28	4/8	9-10	Inverse L.T
29	6/8	11.30-12.30	Examples on inverse
30	6/8	10.30-11.30	Convolution thm & examples (T)
31	8/8	11.30-12.30 Phy. Vaidya	Examples
32	10/8	8-9	Examples on Inverse L.T
33	16/8	8-9	Vector calculus
34	29/8	10.30-11.30	IA-2 discussion vector differentiation problems
35	5/9	10.30-11.30	Examples on vector differentiation (T)
36	7/9	8-9	Curl of a vector
37	10/9	8-9	Vector Integration - Line integral
38	14/9	8-9	Surface integral, Green's thm
39	15/9	8-9	Gauss Divergence thm (T)
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