

# SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

## LESSON-PLAN

Class: M.Sc-Physics I<sup>st</sup> Sem  
 Subject: Mathematical Physics

Semester: ODD/EVEN  
 Session: 2020-21

Lecture Number	Topic
1	Unit-1: Introduction to Vector space, basis & dimensions, norm of a vector
2.	Isomorphism of vectors space, Scalar & inner products of vectors. orthonormal basis
3.	GS Orthogonalization process, Introduction to operators
4.	Linear operators, Intro of matrices
5.	Cayley-Hamilton Theorem.
6.	Inverses of matrix, Orthogonal, unitary & Hermitian matrices
7.	Eigenvalue and eigen vectors of matrices
8	Similarly transformation, Matrix diagonalization
9	Simultaneous diagonalization.
10	Commutation Relation
11.	Revision of Unit-1; Numericals
12.	Revision of unit-1; Numericals
13.	Unit-2: Second order linear differential eq <sup>n</sup> with variable coefficient.
14	Ordinary point, Singular point
15	Series Solution around an ordinary point.
16	Series Solution around a regular point.
17	Frobenius method

Signature:



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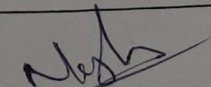
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Lecture Number	Topic
18	Wronskian & getting a second solution.
19	Solution of Legendre's eq <sup>n</sup>
20	Numericals
21	Solution of Bessel's eq <sup>n</sup>
22	Numericals
23	Solution of Laguerre eq <sup>n</sup> .
24	Numericals
25	Solution of Hermite's eq <sup>n</sup>
26	Numericals
27	Revision of unit-2 Numericals
28	Revision of unit-2 Numericals
29	<u>Unit-3</u> . Special function
30	Generating function for Bessel function of integral order (cont)
31	Recurrence Relation, & Integral representation
32	Legendre Polynomials $P_n(x)$
33	Numericals
34.	Generating function for $P_n(x)$

  
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Lecture Number	Topic
35	Recurrence Relation & Orthogonality
36	Rodrigue's Relation
37	Hermite Polynomials
38	Generating functions
39	Rodrigue's relation & orthogonality for Hermite polynomials
40	Laguerre polynomials.
41	Generating function & Recurrence relation & orthogonality
42	The Gamma function.
43	The Dirac delta func.
44	Numericals Revision
45	Revision of Unit-3 ; Numericals
46	<u>Unit-10</u> Integral transform.
47	Laplace transform ; Properties of Laplace transform
48	Laplace transform of Periodic function.
49	Laplace transform of derivative
50	Laplace transform of integrals.
51	Inverse Laplace transform by Partial fractions method

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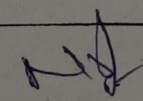
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Lecture Number	Topic
52	Inverse Laplace transform by Partial Fractions
53	Fourier Series
54	Evaluation of Coefficients of Fourier series <sup>Sine &amp; Cosine</sup>
55	Application of Fourier series
56	Fourier transform
57	Fourier sine transform
58	Fourier cosine transform
59	Fourier transform of derivatives
60	Applications of Fourier transforms
61	Revision of Unit 4 Numerical
62	Numerical Revision
63	Numerical Revision



Signature: