LESSON PLAN 2023-24

SUBJECT :THEORY OF MACHINE (4TH SEM)

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Class No.	Topic	Subtopics	Teaching Aids/Activities
Simple Mechanism (08 Classes)			
1	Introduction to Mechanism	Link, Kinematic pair, Kinematic chain, Mechanism, Machine	Charts, diagrams
2	Mechanisms and Machines	Difference, types, examples	Real models
3	Inversion of Mechanism	Concept of inversion, examples	Animation, working models
4	Four Bar Link Mechanism	Structure, types, inversions	Mechanism kits, videos
5	Lower & Higher Pairs	Definition, examples, comparison	Sample parts, board illustrations
6	Cam & Follower – I	Types of cams and followers, classification	Cam profiles, cut-outs
7	Cam & Follower – II	Motion types, construction of cam profile	Graph plotting, software tools
8	Revision	Summary and numerical practice	Quiz, worksheet
Friction (12 Classes)			
9	Introduction to Friction	Laws of friction, applications	Chalkboard demonstration
10	Friction in Screw Threads	Torque, efficiency in square threads	Thread samples
11	Screw Jack Mechanism	Frictional effort, torque calculation	Screw jack demo
12	Bearings Introduction	Classification and purpose	Sample bearings, charts
13	Roller & Ball Bearings	Construction, application	Real samples
14	Needle Roller Bearings	Features, working	Video + sample part
15	Flat & Conical Pivot	Theory and torque transmission	Diagrams
16	Flat Collar Bearings	Single and multiple types	Charts and examples
17	Single Plate Clutch	Working, torque calculation	Clutch model
18	Multi Plate Clutch	Construction, working	Diagram, model
19	Frictional Brakes	Types and working	Brake part sample
20	Dynamometer (Absorption)	Principle, application	Video, working model
Power Transmission (12 Classes)			
21	Power Transmission Basics	Purpose, elements	Concept chart
22	Types of Drives	Belt, gear, chain	Models and videos
23	Velocity Ratio of Belts	Open & cross belts	Derivation on board
24	Length of Belts	With and without slip	Problem sets
25	Belt Tension Ratio	Derivation and importance	Board work

26	Centrifugal & Initial Tension	Concepts, derivation	Animated explanation
27	Power Transmitted by Belts	Formula, examples	Numerical problems
28	Belt Dimensions	Width & thickness design	Design examples
29	V-Belts and Pulleys	Profiles, advantages	V-belt samples
30	Crowning of Pulleys	Purpose and effect	Pulley demo
31	Gear Terminology	Module, pitch, tooth elements	Gear samples
32	Gear Trains	Simple, compound, reverted, epicyclic	Model sets, animations
Governors and Flywheel (12 Classes)			
33	Introduction to Governors	Function, need	Intro video
34	Types of Governors	Watt, Porter, Proell, Hartnell	Real or model governors
35	Watt Governor	Working and calculation	Animated video
36	Porter Governor	Mechanism, torque	Graphs, chart
37	Proell Governor	Description, working	Diagrams
38	Hartnell Governor	Spring-loaded type	Sample model
39	Sensitivity & Stability	Concepts of sensitivity, stability, isochronism	Graphs and formulas
40	Flywheel – Introduction	Function, energy storage	Flywheel sample
41	Fluctuation of Energy	Graphical explanation	Case studies
42	Coefficient of Fluctuation	Formula, calculation	Problems + charts
43	Flywheel vs Governor	Comparison	Summary table
44	Practice Class	Numerical problem solving	Worksheet, quiz
Balancing of Machine (08 Classes)			
45	Balancing – Introduction	Static and dynamic balancing concepts	Basic demo
46	Static Balancing	Principles and examples	Rotating disc activity
47	Dynamic Balancing	Methods and calculation	Motor balancing demo
48	Balancing of Reciprocating Parts	Concepts, practical example	Engine model, charts
49	Causes of Unbalance	Common causes	Real-life case study
50	Effects of Unbalance	Vibrations, performance issues	Industry case video
51	Static vs Dynamic	Differences, examples	Comparative table
52	Revision & Problems	Practice numericals, theory	Question paper-style tasks
Vibration of Machine Parts (08 Classes)			
53	Introduction to Vibration	Terms: amplitude, period, frequency	Wave demos
54	Classification of Vibration	Free, forced, damped	Chart and media content
55	Natural Vibration	Concept and examples	Spring-mass system demo

56	Forced Vibration	Resonance, excitation	Simulation, software
57	Damped Vibration	Overdamped, underdamped, critical	Animated comparison
58	Torsional Vibration	Shaft vibration	Video, shaft sample
59	Longitudinal Vibration	Spring-mass model	Lab setup, demo
60	Causes & Remedies	Control techniques	Summary and test