LESSON PLAN 2023-24

SUBJECT :AUTOMOTIVE TRANSMISSION (5TH SEM)

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Class No.	Topic	Subtopics	Teaching Aids/Activities
1	Introduction to Clutch	Purpose, need for clutch, role in power transmission	Clutch working animation, vehicle demo
2	Types of Clutches	Single plate, multi-plate, centrifugal, diaphragm, cone type	Chart showing types, comparison table, cut section models
3	Clutch Operation	Engagement/disengagement process, frictional contact	Model demonstration, real clutch pedal linkage
4	Clutch Components	Clutch plate, pressure plate, springs, release bearing	Real component inspection, labeled diagram
5	Clutch Facing	Friction material, wear and replacement	Clutch facing samples, workshop tools demo
6	Common Clutch Problems	Slipping, grabbing, drag, juddering, causes	Fault diagnosis flowchart, case study discussion
7	Clutch Adjustment & Servicing	Pedal free play adjustment, hydraulic/clutch cable setting	Workshop practice, live vehicle setup
8	Flywheel, Fluids & Coupling	Flywheel function, fluid coupling basics, torque converter intro	Flywheel demo, coupling animation
9	Introduction to Transmission	Purpose, function of gearbox, gear ratios, basic layout	Transmission cutaway, chart on gear types
10	Types of Transmission	Manual, automatic, semi-automatic, CVT, synchronized	Comparison table, real-life examples
11	Sliding Mesh Gearbox	Gear shifting mechanism, working principle, disadvantages	Physical demo, animation showing gear engagement
12	Constant Mesh Gearbox	Dog clutch mechanism, gear arrangement, benefits over sliding mesh	Model, diagram walkthrough
13	Epicyclic Gearbox & Overdrive	Planetary gear set, overdrive concept, high-speed efficiency	Epicyclic gear model, working video, torque chart
14	Free-Wheel Drive	Purpose, function, one-way clutch mechanism	Cutaway view of free-wheel unit, schematic diagram
15	Gear Selector Mechanism	Gear lever linkage, selector forks, detent mechanism	Transmission shift rail demo, transparent housing model
16	Fluid Torque Converter	Parts (impeller, turbine, stator), fluid coupling vs torque converter	Sectional torque converter model, animated explanation
17	Introduction to Propeller Shaft	Purpose, definition, role in power transmission	Intro video, drivetrain layout diagram
18	Types of Propeller Shaft – Part 1	Two-piece, three-piece, single-piece shafts – basic function	Sample shafts, images, real vehicle examples
19	Types of Propeller Shaft – Part 2	Advantages, limitations, application-based classification	Comparison chart, real part inspection

20	Universal Joint – Introduction	Function, need for flexibility, construction overview	Universal joint model, working video
21	Types of Universal Joints – Part 1	Hooke's joint (cross & bearing type)	Cutaway demo, diagram-based explanation
22	Types of Universal Joints – Part 2	Ball and trunnion joint, constant velocity joint	Real CV joint demo, rotational motion test
23	Sliding Joint	Role in length compensation, working principle	Sliding spline model, prop shaft assembly demo
24	Assembly, Maintenance & Inspection	Faults in U-joints, alignment check, lubrication and play test	Maintenance tools, workshop practice session
25	Introduction to Differential	Need for differential, turning mechanism, power distribution	Intro video, animation showing turning without differential
26	Function of Differential Gear Box	Torque distribution, speed difference during turning	Cutaway differential model, drivetrain diagram
27	Types of Differential – Part 1	Open differential – working principle, applications	Working model, real axle demo
28	Types of Differential – Part 2	Limited slip, locking, torque vectoring differentials	Video comparison, case study (SUV, racing car)
29	Construction of Differential – Part 1	Crown wheel, pinion, bevel gears, spider gears	Exploded view chart, gear inspection tools
30	Construction of Differential – Part 2	Bearings, housing, axle shafts	Component identification session
31	Study of Differential	Assembled unit overview, real-time study	Physical unit demonstration, label & describe activity
32	Inspection & Maintenance	Wear patterns, backlash check, oil level, noise issues	Workshop practice, differential fault diagnosis chart
33	Introduction to Rear Axle	Definition, function, role in power transmission	Axle diagram, cut model, basic drivetrain animation
34	Rear Axle Support – Part 1	Axle location in chassis, sprung/unsprung weight	Suspension setup demo, spring vs. axle model
35	Rear Axle Support – Part 2	Methods of support: semi-floating, full-floating, three-quarter floating	Real axle samples, cross-section models
36	Hotchkiss Drive	Layout, working, torque reaction, applications	Diagram walkthrough, underbody video of vehicle with system
37	Torque Tube Drive	Working, differences from Hotchkiss, rigid connection	Chart comparison, 3D model demo
38	Types of Rear Axle	Live axle, dead axle, drive axle, their function and use	Axle samples, animated examples
39	Rear Axle Casing	Banjo type, split casing, integral casing	Casing models or real vehicle examples
40	Study & Inspection	Oil seal, bearing, leakage, noise and alignment checks	Workshop practice, inspection tools like dial gauges, etc.

41	Introduction to Transmission Systems	Purpose, types (chain, belt, gear, shaft), overview of two-wheeler drive line	Diagrams, cutaway model, comparison chart
42	Moped Power Transmission System	Gearless, belt drive, centrifugal clutch, step-less transmission	Moped drivetrain demo, belt drive system
43	Moped Transmission – Practical Study	Identification of parts, working observation	Real moped unit (open), student observation worksheet
44	Scooter Power Transmission System	CVT, variomatic drive, gearless operation, modern features	Animated video, scooter gearbox model
45	Motorcycle Transmission System	Clutch, constant mesh gearbox, chain drive, gear shift pattern	Motorcycle chain system demo, gear shifter explanation
46	Motorcycle Transmission – Practice	Chain tension check, sprocket alignment, gear oil inspection	Hands-on activity with real motorcycle
47	Bullet Transmission System	Multi-plate clutch, 5-speed gearbox, shaft vs chain transmission	Bullet transmission model, Royal Enfield case study
48	Comparative Study & Troubleshooting	Differences across moped, scooter, motorcycle, bullet; common faults	Comparison chart, group discussion, diagnosis worksheet
49	Introduction to Performance	Importance of performance study, real-world applications	Concept chart, performance video case study
50	Power for Propulsion	Power equation, types of resistance acting on vehicle	Whiteboard derivation, example problems
51	Resistances to Motion – Part 1	Rolling resistance, air resistance, grade resistance	Diagrams, numerical examples
52	Resistances to Motion – Part 2	Calculation techniques, graphical representation	Resistance vs speed curves
53	Tractive Effort & Traction – Concepts	Definition, relation to wheel slip and torque	Tire friction demo, traction chart
54	Tractive Effort – Formulas & Examples	Tractive effort curves, effect of gear ratios	Graph analysis, calculation problems
55	Road Performance Curves – Part 1	Power vs speed, tractive effort vs speed	Graph plotting from data, case study
56	Road Performance Curves – Part 2	Combined curves and vehicle matching	Overlap graph interpretation, worksheet
57	Acceleration – Theoretical Concepts	Time-speed relation, acceleration power requirement	Graphs, acceleration demo (real video of vehicle)
58	Gradeability & Draw-bar Pull	Slope climbing capability, draw-bar definitions and usage	Hill chart demo, pulling force experiment
59	Calculation of Equivalent Weight	Load transfer, dynamic weight effect	Numerical exercises, classroom quiz
60	Maximum Tractive Effort – Calculation	Gear ratio, wheel radius, torque input approach	Problem-solving worksheet, formula sheet distribution