

2007

#	Topic	Comment		
1	Kinematics	Position-time equation	Kinematics	7
2	Kinematics	Velocity-time graph	Dynamics	6
3	Kinematics	Average velocity	Energy	7
4	Kinematics	Free fall	Collisions	3
5	Dynamics	Force and effects	System of Masses	2
6	Kinematics	Position from velocity-time equation	Rigid Bodies	8
7	Energy	Comparison of amounts	Oscillatory Motion	3
8	Gravity	Gravitational potential energy	Gravity	2
9	System of Masses	Motion of center of mass	Fluids	0
10	Rigid Bodies	Rotational analog of Newton's 2nd Law	Other	0
11	Rigid Bodies	Moments of inertia and energy		38
12	Dynamics	Statics, balance of torques		
13	Collisions	Conservation laws		
14	Dynamics	Direction of forces		
15	System of Masses	Translational and rotational dynamics		
16	Collisions	Conservation laws		
17	Kinematics	Acceleration over time in projectile motion		
18	Energy	Conservation of energy		
19	Energy	Spring and conservation of energy		
20	Collisions	Energy, momentum, and velocity		
21	Rigid Bodies	Value of moments of inertia		
22	Energy	Work, energy, momentum		
23	Gravity	Centripetal force		
24	Kinematics	Projectile motion		
25	Oscillatory Motion	Period in water		
26	Dynamics	Kinematics and coefficient of friction		
27	Rigid Bodies	Conservation laws, centripetal force		
28	Rigid Bodies	Analysis of bicycle, equilibrium		
29	Rigid Bodies	Analysis of bicycle, equilibrium		
30	Rigid Bodies	Analysis of bicycle, equilibrium		
31	Rigid Bodies	Rotational inertia of a rod		
32	Oscillatory Motion	Angular frequency		
33	Oscillatory Motion	Angular frequency		
34	Dynamics	Object winding up around a cylinder		
35	Energy	Kinetic energy of object		
36	Dynamics	Original length of rope		
37	Energy	Ratio of velocities		
38	Energy	Ratio of kinetic energies		

2008	Topic	Comment		
1	Kinematics	Uniform acceleration equations	Kinematics	7
2	Kinematics	Displacement	Dynamics	6
3	Kinematics	Velocity from position-time graph	Energy	1
4	Kinematics	Displacement from velocity-time graph	Collisions	3
5	Kinematics	a-t graph from v-t graph	System of Masses	2
6	Kinematics	Projectile motion and range	Rigid Bodies	1
7	Collisions	Conservation laws	Oscillatory Motion	1
8	Dynamics	Friction and centripetal force	Gravity	3
9	Collisions	Conservation laws	Fluids	0
10	Dynamics	Dynamics	Other	1
11	Dynamics	Dynamics		25
12	Rigid Bodies	Moments of inertia and kinetic energy		
13	Oscillatory Motion	Spring constant and amplitude		
14	System of Masses	Angular momentum and energy		
15	Dynamics	Statics, balance of torques		
16	Dynamics	Spring and acceleration		
17	Dynamics	Spring and acceleration		
18	Gravity	Potential and kinetic energy		
19	Energy	Power and acceleration		
20	Other	Young's modulus, elimination of answers		
21	System of Masses	Conservation laws		
22	Collisions	Conservation laws and circular motion		
23	Gravity	Relationship between variables		
24	Kinematics	Bouncing ball		
25	Gravity	Velocity and orbit		

2009	Topic	Comment		
1	Collisions	Impulse and pressure	Kinematics	7
2	Collisions	Motion after elastic collision	Dynamics	4
3	Collisions	Motion after inelastic collision	Energy	1
4	Dynamics	Apparent weight	Collisions	5
5	Gravity	Comparison after angular momentum	System of Masses	0
6	Kinematics	Projectile motion, velocity and angle	Rigid Bodies	1
7	Kinematics	Uniform acceleration equations	Oscillatory Motion	3
8	Kinematics	Rotational motion, ω -t graph	Gravity	3
9	Kinematics	Rotational motion, ω -t graph	Fluids	0
10	Kinematics	Projectile motion	Other	1
11	Kinematics	a-x graph, work		25
12	Energy	Work		
13	Dynamics	Statics, torque		
14	Collisions	Conservation of energy, momentum		
15	Dynamics	Determining coefficient of friction		
16	Oscillatory Motion	Angular frequency of oscillation		
17	Other	Measure quantities in SI units		
18	Oscillatory Motion	Period of pendulum		
19	Kinematics	Projectile motion, height and range		
20	Collisions	Conservation laws		
21	Gravity	Gravitational potential energy		
22	Gravity	Period of orbit		
23	Oscillatory Motion	Simple harmonic motion, power		
24	Dynamics	Tipping over of box		
25	Rigid Bodies	Angular velocity, friction		

2010	Topic	Comment		
1	Kinematics	Position-time graph	Kinematics	6
2	Kinematics	Velocity-time graph	Dynamics	6
3	Kinematics	Acceleration-time graph	Energy	4
4	Kinematics	Free fall	Collisions	1
5	Kinematics	Projectile motion	System of Masses	2
6	Kinematics	Projectile motion, height and range	Rigid Bodies	2
7	Dynamics	Centripetal force, angular momentum	Oscillatory Motion	0
8	Dynamics	Friction, acceleration	Gravity	3
9	Dynamics	Acceleration	Fluids	1
10	Dynamics	Acceleration, friction	Other	0
11	Dynamics	Statics		25
12	Energy	Kinetic energy and projectile motion		
13	Rigid Bodies	Energy and moment of inertia		
14	Collisions	Conservation laws, friction		
15	System of Masses	Conservation laws		
16	System of Masses	Conservation laws		
17	Gravity	Potential energy of configuration		
18	Energy	Force and potential energy		
19	Energy	Potential and position-time graph		
20	Energy	Position-time graph, energy		
21	Gravity	Gravitational self potential energy		
22	Dynamics	Centripetal force		
23	Fluids	Cross-sectional area and velocity		
24	Rigid Bodies	Determining moments of inertia		
25	Gravity	Energy and velocity		

2011	Topic	Comment		
1	Kinematics	Average speed and displacement	Kinematics	5
2	Kinematics	Velocity-time graph	Dynamics	3
3	Kinematics	Velocity-time graph	Energy	2
4	Kinematics	Velocity-time graph	Collisions	1
5	Gravity	Centripetal acceleration	System of Masses	0
6	Collisions	Conservation laws	Rigid Bodies	4
7	Rigid Bodies	Angular momentum, energy	Oscillatory Motion	4
8	Fluids	Fraction of block floating	Gravity	3
9	Dynamics	Force on length of spring	Fluids	2
10	Oscillatory Motion	Factors that increase period	Other	1
11	Fluids	Water level - time graph		25
12	Gravity	Compressive force		
13	Rigid Bodies	Statics, balance of torques		
14	Kinematics	Free fall		
15	Oscillatory Motion	Determination of spring constant		
16	Dynamics	Statics, friction		
17	Dynamics	Acceleration		
18	Energy	Friction, conservation laws		
19	Oscillatory Motion	Return to origin		
20	Oscillatory Motion	Amplitude		
21	Other	Same units		
22	Energy	Torque, rotation frequency, and power		
23	Gravity	Kepler's laws		
24	Rigid Bodies	Rotation, power, friction		
25	Rigid Bodies	Comparison of motion down a plane		

2012	Topic	Comment		
1	Kinematics	Free fall	Kinematics	4
2	Kinematics	Projectile motion, height and range	Dynamics	5
3	Dynamics	Angle for toppling	Energy	3
4	System of Masses	Conservation laws	Collisions	1
5	Collisions	Loss of kinetic energy	System of Masses	1
6	Kinematics	Free fall	Rigid Bodies	2
7	Kinematics	Free fall	Oscillatory Motion	3
8	Energy	Friction, conservation of energy	Gravity	2
9	Gravity	Escape velocity	Fluids	2
10	Rigid Bodies	Comparison of acceleration down a plane	Other	2
11	Dynamics	Change in forces over time		25
12	Dynamics	Change in forces over time		
13	Energy	Work and velocity		
14	Rigid Bodies	Torque, moments of inertia		
15	Energy	Power and velocity		
16	Oscillatory Motion	Vibration frequency of spring		
17	Oscillatory Motion	Period-amplitude graph		
18	Oscillatory Motion	Relationship between variables		
19	Fluids	Energy, power, velocity		
20	Fluids	Buoyancy, apparent weight		
21	Dynamics	Change in height of springs		
22	Other	Equivalent units		
23	Other	Equipments used to determine constants		
24	Dynamics	Determining spring constant		
25	Gravity	Comparison of velocities and orbits		

2013	Topic	Comment		
1	Kinematics	Uniform acceleration equations	Kinematics	3
2	Kinematics	Elastic collision with wall	Dynamics	8
3	Kinematics	Projectile motion	Energy	5
4	Dynamics	Statics, balance of torques	Collisions	1
5	Dynamics	Aparent weight, velocity	System of Masses	2
6	Dynamics	Aparent weight, velocity	Rigid Bodies	2
7	Energy	Comparison of momentum and energy	Oscillatory Motion	1
8	Energy	Conservation laws	Gravity	1
9	Energy	Conservation laws	Fluids	1
10	Rigid Bodies	Solid and hollow spheres	Other	1
11	System of Masses	Normal force of system to table		25
12	Rigid Bodies	Acceleration and moments of inertia		
13	Gravity	Velocity and distance		
14	Collisions	Velocity of center of mass		
15	Fluids	Fraction of rod above water		
16	Other	Same units		
17	Dynamics	Change in forces over time		
18	System of Masses	Conservation laws		
19	Dynamics	Tension, pendulum		
20	Dynamics	Tension, pendulum		
21	Oscillatory Motion	Determination of period		
22	Dynamics	Statics, balance of torques		
23	Energy	Determination of spring constant		
24	Energy	Extension of cord		
25	Dynamics	Power and velocity		

2014	Topic	Comment		
1	Dynamics	Angular momentum & acceleration vectors	Kinematics	0
2	Rigid Bodies	Direction of force	Dynamics	7
3	Fluids	Floating object	Energy	5
4	System of Masses	Conservation laws	Collisions	2
5	Dynamics	Torques, centripetal force	System of Masses	3
6	Collisions	Coefficient of restitution	Rigid Bodies	2
7	Dynamics	Statics, balance of torques	Oscillatory Motion	1
8	Oscillatory Motion	Determining period	Gravity	2
9	Energy	Impulse, velocity	Fluids	1
10	Dynamics	Tension, centripetal force	Other	2
11	Energy	Energy graphs		25
12	Other	Same units		
13	Other	Same units		
14	Rigid Bodies	Translational and rotational kinetic energy		
15	Energy	Power and velocity		
16	Collisions	Speed ratio		
17	Gravity	Determining gravitational acceleration		
18	Dynamics	Tension, pulley system		
19	Dynamics	Air resistance		
20	Energy	Centripetal force		
21	Dynamics	Moments of inertia, pulley system		
22	Gravity	Relationship between variables		
23	System of Masses	Impulse, conservation laws		
24	System of Masses	Velocity turns through an angle		
25	Energy	Friction, conservation laws		

2015	Topic	Comment		
1	Kinematics	Addition of velocities	Kinematics	4
2	Kinematics	Average speed	Dynamics	4
3	Energy	Force and power	Energy	6
4	Dynamics	Graph analysis of motion	Collisions	4
5	Kinematics	Projectile motion	System of Masses	0
6	Collisions	Conservation of momentum	Rigid Bodies	0
7	Collisions	Conservation of momentum	Oscillatory Motion	2
8	Collisions	Conservation of momentum	Gravity	0
9	Collisions	Conservation of momentum	Fluids	2
10	Energy	Analysis of kinetic energies from collisions	Other	3
11	Fluids	Buoyancy		25
12	Dynamics	Acceleration of pendulum		
13	Dynamics	Direction of pendulum acceleration		
14	Dynamics	Forces and circular motion		
15	Energy	Work-energy theorem		
16	Energy	Analysis of potential energy graph		
17	Other	Dimensional analysis		
18	Other	Re-expression of data		
19	Oscillatory Motion	Oscillation of a liquid in a U-tube		
20	Fluids	Balance of forces, equilibrium		
21	Kinematics	Coefficient of restitution, infinite series		
22	Energy	Graph analysis		
23	Energy	Vertical spring, conservation of energy		
24	Other	Transverse wave, fundamental frequencies		
25	Oscillatory Motion	Coupled oscillators		

2016	Topic	Comment		
1	Kinematics	Angular velocity of car wheels	Kinematics	5
2	Fluids	Adding oil to water	Dynamics	3
3	Energy	Book hitting snow	Energy	4
4	Dynamics	Sliding bead, finding acceleration	Collisions	1
5	Kinematics	Projectile motion, reference frames	System of Masses	2
6	Kinematics	Projectile motion, reference frames	Rigid Bodies	3
7	Oscillatory Motion	Oscillating mass, linear approximations	Oscillatory Motion	3
8	Gravity	Kepler's laws	Gravity	1
9	Energy	Sliding bead	Fluids	2
10	Dynamics	Two hanging blocks	Other	1
11	Energy	Power output and maximum velocity		25
12	Fluids	Acceleration of container		
13	Collisions	Elastic and perfectly inelastic collisions		
14	Oscillatory Motion	Rod oscillation, linear approximations		
15	Oscillatory Motion	Rod oscillation, linear approximations		
16	Kinematics	Reference frame, projectile motion		
17	Rigid Bodies	Rotating sphere under friction		
18	Kinematics	Angular kinematics		
19	Energy	Projectile motion		
20	Rigid Bodies	Critical angle, center of mass		
21	System of Masses	Center of mass		
22	System of Masses	Conservation of energy		
23	Dynamics	Making linear approximations		
24	Rigid Bodies	Calculating moments inertia		
25	Other	Error propagation		

2017	Topic	Comment		
1	Dynamics	Friction, circular motion	Kinematics	3
2	Oscillatory Motion	Coupled oscillators	Dynamics	5
3	System of Masses	Center of mass	Energy	3
4	Kinematics	Constant acceleration motion	Collisions	3
5	Kinematics	Maximizing range	System of Masses	3
6	Dynamics	Balance of torques	Rigid Bodies	3
7	Energy	System with increasing energy	Oscillatory Motion	1
8	Energy	Power, accounting for dissipation	Gravity	1
9	Fluids	Comparing pressures	Fluids	2
10	Fluids	Gauge pressure	Other	1
11	System of Masses	Center of mass, torques		25
12	System of Masses	Center of mass, torques		
13	Dynamics	Atwood machine, limiting case		
14	Rigid Bodies	Rolling down an incline		
15	Rigid Bodies	Comparing moments of inertia		
16	Rigid Bodies	Motion of a rod		
17	Kinematics	Free fall motion		
18	Dynamics	Tracking acceleration vector		
19	Dynamics	Infer coefficient of friction from graph		
20	Collisions	Completely inelastic		
21	Collisions	Elastic, momentum transfer		
22	Collisions	Elastic, energy transfer		
23	Other	Speed of wave in string		
24	Energy	Collision, potential energy in spring		
25	Gravity	Orbital speeds, conservation of energy		

2018A	Topic	Comment		
1	Dynamics	Air resistance, terminal velocity	Kinematics	1
2	Collisions	Velocity of center of mass	Dynamics	5
3	Collisions	Energy and momentum conservation	Energy	3
4	Energy	Maximize kinetic energy	Collisions	3
5	System of Masses	Center of mass	System of Masses	1
6	Energy	Work-energy theorem	Rigid Bodies	4
7	Kinematics	Symmetry, path of shortest time	Oscillatory Motion	3
8	Rigid Bodies	Rolling without slipping	Gravity	1
9	Rigid Bodies	Force equation, torque equation	Fluids	1
10	Dynamics	Air resistance, acceleration	Other	3
11	Oscillatory Motion	Effective spring constant		25
12	Other	Error propagation		
13	Other	Young's modulus		
14	Oscillatory Motion	Physical pendulum, moments of inertia		
15	Gravity	Kinetic and potential energies of satellite		
16	Dynamics	Noninertial frame, fictitious forces		
17	Dynamics	Dropping sand from helicopter		
18	Dynamics	Vertical circular motion		
19	Collisions	Raindrops falling on the ground		
20	Energy	Elastic energy, effective spring constant		
21	Rigid Bodies	Rolling without slipping		
22	Fluids	Sinking boat		
23	Rigid Bodies	Rolling, angular acceleration		
24	Oscillatory Motion	Increasing amplitude of pendulum		
25	Other	Error propagation		

2018B	Topic	Comment		
1	Collisions	Clay hitting the ground	Kinematics	1
2	Energy	Dissipation from friction	Dynamics	7
3	Collisions	Energy after perfectly inelastic collision	Energy	2
4	Collisions	Conservation of energy and momentum	Collisions	4
5	Kinematics	Ratio of angular accelerations	System of Masses	0
6	Other	Dimensional analysis	Rigid Bodies	3
7	Oscillatory Motion	Resonance, maximizing amplitude	Oscillatory Motion	2
8	Rigid Bodies	Torque, rolling without slipping	Gravity	0
9	Collisions	Conservation of energy and momentum	Fluids	2
10	Fluids	Compressible air, buoyant force	Other	4
11	Other	Speed of waves in string		25
12	Dynamics	Noninertial frame, fictitious forces		
13	Dynamics	Friction, slipping between blocks		
14	Rigid Bodies	Torque, slip without rotating		
15	Dynamics	Acceleration, scale reading		
16	Dynamics	Plane flight, engine power		
17	Energy	Vertical spring, conservation of energy		
18	Dynamics	Effective spring constant & length		
19	Other	Error propagation		
20	Dynamics	Friction, rope hanging over table		
21	Oscillatory Motion	Physical pendulum, moment of inertia		
22	Dynamics	Perturbation to Atwood machine		
23	Rigid Bodies	CM frame, circular orbit		
24	Fluids	Effect of gravity as a fluid, Pascal's law		
25	Other	Error propagation		

2019A	Topic	Comment		
1	Dynamics	Free fall, drag, terminal velocity	Kinematics	3
2	Collisions	Elastic, perfectly inelastic, ratio of energies	Dynamics	4
3	Collisions	Conservation of momentum, energy	Energy	4
4	Oscillatory Motion	Vertical spring, period	Collisions	2
5	Rigid Bodies	Balance torques, rolling	System of Masses	0
6	Kinematics	Inclined plane, bouncing, change of axes	Rigid Bodies	5
7	Energy	Conservation of energy, centripetal force	Oscillatory Motion	2
8	Gravity	Trajectory, circular orbit, escape velocity	Gravity	2
9	Rigid Bodies	Rolling motion, velocity addition	Fluids	2
10	Rigid Bodies	Calculating moment of inertia	Other	1
11	Other	Error propagation		25
12	Kinematics	Bouncing ball, change of variables		
13	Energy	Power, kinetic energy delivered periodically		
14	Dynamics	Coriolis force, deflection, kinematics		
15	Rigid Bodies	Center of mass frame, rotating rod		
16	Kinematics	Dropping stone, error propagation		
17	Rigid Bodies	Statics, balance torques, clamped disc		
18	Energy	Conservation of energy, kinetic energy		
19	Fluids	Pendulum in water, change of frequency		
20	Energy	Mass-spring system, stable equilibrium		
21	Gravity	Cloud of dust, circular orbits		
22	Dynamics	Circular motion, tensions, limiting cases		
23	Dynamics	Direction of friction, center of mass		
24	Oscillatory Motion	Potential landscape, simple harmonic motion		
25	Fluids	Noninertial frame, effective gravity, Torricelli		

2019B	Topic	Comment		
1	Energy	Inclined plane, dissipation to friction	Kinematics	3
2	Fluids	Different densities, oil, water, buoyancy	Dynamics	7
3	Dynamics	Springs in series, potential energies	Energy	1
4	Gravity	Conservation of energy, collision time	Collisions	0
5	Gravity	Shell theorem, gravitational acceleration	System of Masses	1
6	Gravity	Gauss's law of gravity, density of dust	Rigid Bodies	4
7	Fluids	Pascal's law, distribution of pressure	Oscillatory Motion	1
8	Dynamics	Pushing on a scale, balancing forces	Gravity	4
9	Rigid Bodies	Balancing torques, statics	Fluids	2
10	System of Masses	Conservation of momentum	Other	2
11	Rigid Bodies	Calculating moment of inertia		25
12	Gravity	Kepler's 3rd law, energy, angular momentum		
13	Kinematics	Height, range equations		
14	Kinematics	Range equation, trajectory reflection		
15	Dynamics	Centripetal force, similar triangles		
16	Rigid Bodies	Kinetic friction, rolling motion, kinematics		
17	Rigid Bodies	Kinetic friction, rolling motion, kinematics		
18	Other	Kinematics, error propagation		
19	Dynamics	Swinging pendulum, total acceleration		
20	Kinematics	Inclined plane, sliding up and down		
21	Dynamics	General Newton's 2nd law, dropping sand		
22	Dynamics	Impulse-momentum, average pressure		
23	Oscillatory Motion	Simple harmonic motion, acceleration		
24	Dynamics	Atwood machine, acceleration		
25	Other	Error propagation, dominant uncertainty		

2020A	Topic	Comment		
1	Energy	Free fall, conservation of energy	Kinematics	1
2	Rigid Bodies	Rolling without slipping	Dynamics	6
3	Other	Dimensional analysis, energy	Energy	3
4	Dynamics	Circular motion, rods	Collisions	2
5	Oscillatory Motion	Simple pendulum, resonance	System of Masses	1
6	Gravity	Conservation of angular momentum	Rigid Bodies	4
7	Gravity	Energy, period of elliptical orbit	Oscillatory Motion	2
8	Kinematics	Exponential motion	Gravity	2
9	Dynamics	Pulley system, equilibrium	Fluids	1
10	Dynamics	Pulley system, string length	Other	3
11	Other	Tensile strength		25
12	Oscillatory Motion	Period of a physical pendulum		
13	Rigid Bodies	Angular momentum, cross product		
14	Dynamics	Friction between two masses, slipping		
15	Fluids	Gauge pressure, Pascal's law		
16	Energy	Conservation of energy, surface tension		
17	Collisions	Falling rain, general Newton's 2nd law		
18	System of Masses	Conservation of angular momentum		
19	Rigid Bodies	Rolling without slipping, velocity addition		
20	Energy	Power output, time averaging		
21	Rigid Bodies	Tipping over a table, torques		
22	Collisions	Invariant properties of collisions		
23	Other	Error propagation, spring constant		
24	Dynamics	Circular motion, shifting equilibrium		
25	Dynamics	Stable equilibrium, spring system		

2020B	Topic	Comment		
1	Kinematics	Elastic collisions, free fall	Kinematics	1
2	Rigid Bodies	Perpendicular axis theorem	Dynamics	5
3	Dynamics	Conical pendulum	Energy	3
4	Dynamics	Weightlessness, accelerating frames	Collisions	2
5	Gravity	Elliptical orbits, angular momentum	System of Masses	1
6	Rigid Bodies	Choosing torque axis, maximum forces	Rigid Bodies	4
7	Gravity	Energy, period of elliptical orbit	Oscillatory Motion	3
8	Dynamics	Friction, changing reference frames	Gravity	2
9	Dynamics	Spring force, Atwood machine	Fluids	2
10	Oscillatory Motion	Effective spring constant	Other	2
11	Energy	Definition of work		25
12	Rigid Bodies	Platform attached to wall, equilibrium		
13	Oscillatory Motion	Physical pendulum, moments of inertia		
14	Collisions	Perfectly inelastic collisions		
15	Fluids	Valves, balancing pressures		
16	Oscillatory Motion	Matching periods, kinematics		
17	Energy	Conservation of energy, elastic collision		
18	Energy	Principle of virtual work		
19	Rigid Bodies	Angular momentum, rotational kinetic energy		
20	Fluids	Inflated balloon, scale		
21	System of Masses	Conservation of angular momentum		
22	Dynamics	Kinetic friction, kinematics		
23	Other	Dimensional analysis		
24	Collisions	Elastic collisions, maximizing velocity		
25	Other	Error propagation		

2021	Topic	Comment		
1	Dynamics	Rolling up incline, velocity over time	Kinematics	4
2	Dynamics	Rolling up incline, horizontal velocity	Dynamics	9
3	System of Masses	Balancing torques	Energy	1
4	Dynamics	Coriolis force, deflection	Collisions	1
5	Kinematics	Shortest path, accelerations	System of Masses	2
6	Energy	Lifting bucket of water	Rigid Bodies	1
7	Collisions	Collisions between two walls	Oscillatory Motion	1
8	Other	Error propagation	Gravity	4
9	Dynamics	Weightlessness, kinematics	Fluids	0
10	System of Masses	Conservation of angular momentum	Other	2
11	Kinematics	Projectile motion, comparing times		25
12	Dynamics	Friction, mass-spring system		
13	Dynamics	Nonuniform circular motion		
14	Other	Dimensional analysis		
15	Dynamics	Sliding down incline, kinematics		
16	Kinematics	Exponential motion		
17	Dynamics	Centripetal acceleration		
18	Kinematics	Rising smoke, relative velocities		
19	Gravity	Principle of superposition, negative mass		
20	Gravity	Period of Moon's rotation		
21	Rigid Bodies	Rolling without slipping, down incline		
22	Dynamics	Friction, normal forces		
23	Oscillatory Motion	Force-position graph, period of oscillation		
24	Gravity	Energy, period of elliptical orbit		
25	Gravity	Angular momentum, escape velocities		

2022A	Topic	Comment		
1	Kinematics	Free fall	Kinematics	4
2	Kinematics	Constant acceleration equations	Dynamics	8
3	Collisions	Energy loss of inelastic collision	Energy	1
4	Dynamics	Trajectory of pendulum	Collisions	1
5	Rigid Bodies	Rolling without slipping, kinetic energy	System of Masses	1
6	Dynamics	Pendulum, maximum tension	Rigid Bodies	3
7	Other	Re-expression of data	Oscillatory Motion	1
8	Dynamics	Block on inclined plane, friction force	Gravity	2
9	Dynamics	Atwood machine, conservation of string	Fluids	3
10	Oscillatory Motion	Simple pendulum, period of oscillation	Other	1
11	Gravity	Conservation of energy		25
12	Rigid Bodies	Newton's 2nd law, angular acceleration		
13	Dynamics	Balancing torques		
14	Energy	Sliding down bowl, velocity components		
15	Kinematics	Projectile motion, limiting cases		
16	Dynamics	Torque balance, static friction		
17	Rigid Bodies	Momentum and energy of rod, center of mass		
18	Fluids	Buoyant force, floating		
19	Fluids	Hydrostatic force, buoyancy, pressure		
20	Kinematics	Projectile motion, parabola		
21	Fluids	Buoyant force, effective gravity		
22	System of Masses	Inclined plane, acceleration constraint		
23	Dynamics	Linear drag, quadratic drag		
24	Gravity	Area of elliptical orbit		
25	Dynamics	Rubber band around cylinder, linearization		

2022B	Topic	Comment		
1	Kinematics	Projectile motion, bouncing from inclined plane	Kinematics	4
2	Rigid Bodies	Moments of inertia around multiple axes	Dynamics	5
3	System of Masses	Center of mass, torque balance	Energy	2
4	Kinematics	Projectile motion, free fall frame	Collisions	2
5	Kinematics	Relative velocity, average speed	System of Masses	3
6	Energy	Work-energy theorem, pushing a block	Rigid Bodies	2
7	Dynamics	Atwood machine, effective mass	Oscillatory Motion	2
8	Kinematics	Projectile motion, bouncing from inclined plane	Gravity	2
9	Dynamics	Pushing box on ground	Fluids	2
10	Dynamics	Adding spring constants	Other	1
11	Fluids	Buoyant force, atmospheric pressure		25
12	Dynamics	Pulleys on inclined plane, direction of friction		
13	Collisions	Ballistic pendulum, angular momentum		
14	Fluids	Surface energy, viscosity		
15	Gravity	Centripetal force, thrust		
16	Dynamics	Torque balance, block on inclined plane		
17	Collisions	Elastic collision, center of mass frame		
18	Oscillatory Motion	Mass-spring system, simple harmonic motion		
19	Oscillatory Motion	Mass-spring system, angular oscillations		
20	Rigid Bodies	Rolling without slipping, accelerating frame		
21	Other	Error propagation		
22	Gravity	Perigee of elliptical orbit, escape velocity		
23	Energy	Energy of simple harmonic motion		
24	System of Masses	Block sliding down ramp, energy conservation		
25	System of Masses	Conservation laws, relative speed		

2023	Topic	Comment		
1	Kinematics	Average speed vs. average velocity	Kinematics	5
2	Dynamics	Centripetal and tangential acceleration	Dynamics	7
3	Kinematics	Bouncing ball on incline	Energy	2
4	Energy	Computing work, box on inclined plane	Collisions	1
5	Dynamics	Atwood machine	System of Masses	1
6	Dynamics	Circular motion, small angle approximation	Rigid Bodies	3
7	Dynamics	Sliding blocks, static friction	Oscillatory Motion	2
8	System of Masses	CM frame, two-body problem	Gravity	2
9	Energy	Helium balloon, gravitational potential energy	Fluids	1
10	Kinematics	Projectile motion, range equation	Other	1
11	Kinematics	Range equation, height equation		25
12	Dynamics	Hanging mass, tension		
13	Dynamics	Lifting a block, static friction		
14	Rigid Bodies	Balancing torques, center of mass		
15	Gravity	Gauss's law, orbit velocity		
16	Oscillatory Motion	Simple pendulum, elastic collision		
17	Rigid Bodies	Comparing moments of inertia		
18	Fluids	Buoyant force, scale reading		
19	Other	Error propagation		
20	Oscillatory Motion	Simple pendulum, velocity components		
21	Rigid Bodies	Conservation laws, two-body problem		
22	Dynamics	Effective spring constant, free pulley		
23	Gravity	Parallax, small angle approximation		
24	Collisions	Elastic collisions, probability		
25	Kinematics	Projectile motion, inclined plane		

2024	Topic	Comment		
1	Kinematics	Projectile motion	Kinematics	3
2	Dynamics	Circular motion, balancing forces	Dynamics	6
3	Dynamics	Linked rods, statics	Energy	1
4	Kinematics	Bouncing ball, kinetic energy	Collisions	1
5	Dynamics	Block on inclined plane, normal force	System of Masses	1
6	Oscillatory Motion	Simple pendulum, velocity of oscillator	Rigid Bodies	2
7	Kinematics	Motion graph	Oscillatory Motion	3
8	Rigid Bodies	Sliding rod, velocity constraints	Gravity	3
9	Energy	Energy dissipation, coefficient of friction	Fluids	2
10	Dynamics	Centrifugal force, springs	Other	3
11	Fluids	Air pressure, balancing forces		25
12	Gravity	Computing torque		
13	Dynamics	Atwood machine, limiting cases		
14	System of Masses	Bead sliding on hoop, conservation laws		
15	Other	Dimensional analysis, viscosity		
16	Other	Dimensional analysis, projectile motion		
17	Dynamics	Atwood machine, springs, conservation of string		
18	Gravity	Elliptical orbits, orbit velocity		
19	Oscillatory Motion	Physical pendulum, center of mass		
20	Oscillatory Motion	Energy conservation, period of oscillation		
21	Fluids	Bernoulli's principle, continuity equation		
22	Gravity	Shell theorem, gravitational field		
23	Collisions	Inelastic collisions, changing reference frames		
24	Other	Dimensional analysis, quadratic drag		
25	Rigid Bodies	Energy conservation, conservation of string		

%	Avg appearance	TOTAL:	
14.39	3.60	Kinematics	81
22.38	5.60	Dynamics	126
11.37	2.84	Energy	64
7.82	1.95	Collisions	44
5.15	1.29	System of Masses	29
11.19	2.80	Rigid Bodies	63
7.82	1.95	Oscillatory Motion	44
7.99	2.00	Gravity	45
5.51	1.38	Fluids	31
6.39	1.60	Other	36
100.00	25.00		563

Other Dimensional analysis, elasticities, waves, etc.