Chapter 9: Gravitation Quiz

Introduction to Gravitation

1. What force keeps the planets moving around the sun?

○ Gravitational force
○ Magnetic force
○ Friction
○ Electrostatic force

Answer: Gravitational force

2. Newton saw an apple fall. This led to the idea of?

○ Gravity
○ Light
○ Sound
○ Electricity

Answer: Gravity

3. Does the earth attract the moon?

○ Yes
○ No
○ Only during full moon
○ Only during eclipse

Answer: Yes

4. Is gravitational force limited to earth?

○ No, it is universal
○ Yes
○ Only solar system
○ Only nearby objects

Answer: No, it is universal

5. Who formulated the Universal Law of Gravitation?

○ Isaac Newton
○ Galileo
○ Einstein
○ Kepler

Answer: Isaac Newton

Centripetal Force

1. Centripetal force acts towards?

○ The centre of the circle
○ Away from centre
○ Tangent to circle
○ Upwards

Answer: The centre of the circle

2. What happens if centripetal force ceases?

○ Object flies off along tangent
○ Object stops
○ Object moves to centre
○ Object spirals

Answer: Object flies off along tangent

3. Motion of moon around earth is due to?

○ Centripetal force provided by gravity
○ Wind
○ Magnetic force
○ Rocket propulsion

Answer: Centripetal force provided by gravity

4. Does velocity change in uniform circular motion?

○ Yes, direction changes
○ No
○ Only magnitude changes
○ Only speed changes

Answer: Yes, direction changes

5. Centripetal means?

○ Centre-seeking
○ Centre-fleeing
○ Circular
○ Fast

Answer: Centre-seeking

Universal Law of Gravitation

1. Force is proportional to?

○ Product of masses
○ Sum of masses
○ Difference of masses
○ Division of masses

Answer: Product of masses

2. Force is inversely proportional to?

○ Square of distance
○ Distance
○ Cube of distance
○ Square root of distance

Answer: Square of distance

3. The value of G (Gravitational Constant) is?

○ 6.673 x 10^-11 Nm^2/kg^2
○ 9.8 m/s^2
○ 10 m/s^2
○ 3 x 10^8 m/s

Answer: 6.673 x 10^-11 Nm^2/kg^2

4. Who determined the value of G?

○ Henry Cavendish
○ Newton
○ Galileo
○ Kepler

Answer: Henry Cavendish

5. The force acts along?

○ Line joining centres of two objects
○ Tangent
○ Perpendicular
○ Random direction

Answer: Line joining centres of two objects

Free Fall

1. Free fall means object falling under?

○ Gravity alone
○ Air resistance
○ Magnetic force
○ Wind

Answer: Gravity alone

2. During free fall, what changes?

○ Velocity magnitude
○ Direction
○ Mass
○ Shape

Answer: Velocity magnitude

3. Acceleration during free fall is denoted by?

○ g
○ G
○ a
○ f

Answer: g

4. Is direction of motion changed in free fall?

○ No
○ Yes
○ Sometimes
○ Depends on mass

Answer: No

5. Earth attracts objects due to?

○ Gravitational force
○ Magnetic force
○ Electrostatic force
○ Friction

Answer: Gravitational force

Acceleration due to Gravity

1. Value of g on earth surface is approx?

○ 9.8 m/s^2
○ 6.7 m/s^2
○ 1.6 m/s^2
○ 100 m/s^2

Answer: 9.8 m/s^2

2. Does g depend on mass of the falling object?

○ No
○ Yes
○ Only for heavy objects
○ Only for light objects

Answer: No

3. Value of g is greater at?

○ Poles
○ Equator
○ Same everywhere
○ Mountain top

Answer: Poles

4. Unit of g is same as?

○ Acceleration
○ Velocity
○ Force
○ Work

Answer: Acceleration

5. Formula for g is?

○ GM/R^2
○ Gm/d^2
○ F/m
○ ma

Answer: GM/R^2

Motion under Gravity Equations

1. Equation for velocity in free fall?

○ v = u + gt
○ v = u + at
○ s = ut + 1/2gt^2
○ v^2 - u^2 = 2gs

Answer: v = u + gt

2. If object is thrown up, g is taken as?

○ Negative
○ Positive
○ Zero
○ Constant

Answer: Negative

3. At maximum height, velocity is?

○ Zero
○ Maximum
○ Minimum
○ 9.8 m/s

Answer: Zero

4. Distance formula in free fall?

○ s = ut + 1/2gt^2
○ s = vt
○ s = u + v
○ s = gt

Answer: s = ut + 1/2gt^2

5. If dropped from rest, initial velocity u is?

○ 0
○ 9.8
○ Maximum
○ 1

Answer: 0

Mass vs Weight

1. Mass is a measure of?

○ Inertia
○ Gravity
○ Weight
○ Force

Answer: Inertia

2. Does mass change on the moon?

○ No
○ Yes
○ Becomes zero
○ Increases

Answer: No

3. Weight is defined as?

○ Force with which earth attracts an object
○ Mass x Volume
○ Inertia
○ Quantity of matter

Answer: Force with which earth attracts an object

4. SI unit of Weight is?

○ Newton
○ Kilogram
○ Pascal
○ Joule

Answer: Newton

5. Formula for Weight is?

○ W = mg
○ W = ma
○ W = m/g
○ W = mv

Answer: W = mg

Weight on the Moon

1. Weight on moon is what fraction of weight on earth?

○ 1/6
○ 1/2
○ 1/10
○ Same

Answer: 1/6

2. Why is weight less on moon?

○ Moon has less mass and weaker gravity
○ Moon has no atmosphere
○ Moon is smaller
○ Moon is far

Answer: Moon has less mass and weaker gravity

3. If mass is 6kg on earth, mass on moon is?

○ 6kg
○ 1kg
○ 36kg
○ 0kg

Answer: 6kg

4. If weight is 60N on earth, weight on moon is?

○ 10N
○ 6N
○ 60N
○ 360N

Answer: 10N

5. Does g value change on moon?

○ Yes, it is less
○ No, it is constant
○ Yes, it is more
○ It is zero

Answer: Yes, it is less

Thrust and Pressure

1. Thrust is force acting?

○ Perpendicular to surface
○ Parallel to surface
○ At any angle
○ Opposite to gravity

Answer: Perpendicular to surface

2. Pressure is?

○ Thrust per unit area
○ Force x Area
○ Mass per unit volume
○ Thrust x Time

Answer: Thrust per unit area

3. SI unit of pressure is?

○ Pascal
○ Newton
○ Joule
○ Watt

Answer: Pascal

4. For same force, smaller area gives?

○ Larger pressure
○ Smaller pressure
○ Same pressure
○ Zero pressure

Answer: Larger pressure

5. Why do school bags have wide straps?

○ To reduce pressure on shoulders
○ To look good
○ To increase weight
○ To increase pressure

Answer: To reduce pressure on shoulders

Pressure Examples

1. Why are knives sharp?

○ To increase pressure for cutting
○ To decrease pressure
○ To look shiny
○ To serve food

Answer: To increase pressure for cutting

2. Why do camels walk easily on sand?

○ Broad feet reduce pressure
○ Sharp feet
○ Heavy weight
○ Long legs

Answer: Broad feet reduce pressure

3. Why do trucks have wide tyres?

○ To distribute weight and reduce pressure
○ To move fast
○ To look big
○ To increase friction

Answer: To distribute weight and reduce pressure

4. A sharp nail penetrates easily because?

○ Small area exerts high pressure
○ It is made of iron
○ It is heavy
○ It is long

Answer: Small area exerts high pressure

5. Walking on sand is harder than lying down because?

○ Feet have smaller area, exert more pressure
○ Feet are heavy
○ Sand is hot
○ Lying increases weight

Answer: Feet have smaller area, exert more pressure

Buoyancy

1. Upward force exerted by fluid is called?

○ Buoyant force
○ Gravitational force
○ Friction
○ Tension

Answer: Buoyant force

2. Another name for buoyant force is?

○ Upthrust
○ Downthrust
○ Weight
○ Pressure

Answer: Upthrust

3. Does air exert buoyant force?

○ Yes
○ No
○ Only on balloons
○ Only on birds

Answer: Yes

4. Magnitude of buoyant force depends on?

○ Density of fluid
○ Color of fluid
○ Temperature of object
○ Shape of container

Answer: Density of fluid

5. Why does a mug feel lighter in water?

○ Due to buoyancy
○ Water reduces mass
○ Gravity stops working
○ Mug absorbs water

Answer: Due to buoyancy

Why Objects Float or Sink

1. An object floats if its density is?

○ Less than liquid
○ More than liquid
○ Equal to liquid
○ Zero

Answer: Less than liquid

2. An object sinks if its density is?

○ Greater than liquid
○ Less than liquid
○ Equal to liquid
○ Very low

Answer: Greater than liquid

3. Cork floats on water because?

○ Density of cork < Density of water
○ Cork is heavy
○ Cork is wood
○ Water pushes it down

Answer: Density of cork < Density of water

4. Iron nail sinks because?

○ Density of iron > Density of water
○ Iron is magnetic
○ Iron is solid
○ Water pulls it

Answer: Density of iron > Density of water

5. Density is defined as?

○ Mass per unit volume
○ Volume per unit mass
○ Weight per area
○ Force per volume

Answer: Mass per unit volume

Archimedes' Principle

1. Archimedes' Principle states upward force equals?

○ Weight of fluid displaced
○ Weight of object
○ Volume of object
○ Density of fluid

Answer: Weight of fluid displaced

2. Who discovered this principle?

○ Archimedes
○ Newton
○ Pascal
○ Bernoulli

Answer: Archimedes

3. This principle applies to?

○ Both liquids and gases (fluids)
○ Only water
○ Only gases
○ Only solids

Answer: Both liquids and gases (fluids)

4. When body is fully immersed, volume of fluid displaced equals?

○ Volume of body
○ Weight of body
○ Mass of body
○ Area of body

Answer: Volume of body

5. Eureka means?

○ I have found it
○ I am lost
○ Water is hot
○ Gold is pure

Answer: I have found it

Applications of Archimedes' Principle

1. Which instrument measures purity of milk?

○ Lactometer
○ Hydrometer
○ Barometer
○ Thermometer

Answer: Lactometer

2. Which instrument measures density of liquids?

○ Hydrometer
○ Lactometer
○ Voltmeter
○ Speedometer

Answer: Hydrometer

3. Archimedes' principle is used in designing?

○ Ships and submarines
○ Cars
○ Planes
○ Rockets

Answer: Ships and submarines

4. Why do steel ships float?

○ They displace water equal to their weight
○ Steel is light
○ Engines push them up
○ Air holds them

Answer: They displace water equal to their weight

5. A submarine dives by?

○ Taking in water to increase weight
○ Releasing air
○ Using propeller
○ Dropping anchor

Answer: Taking in water to increase weight

Summary of Gravitation

1. Gravitational force is a?

○ Weak force unless large masses involved
○ Strong force
○ Repulsive force
○ Short range force

Answer: Weak force unless large masses involved

2. Weight varies because?

○ g varies from place to place
○ Mass varies
○ Earth is round
○ Air pressure varies

Answer: g varies from place to place

3. Value of g decreases with?

○ Altitude
○ Depth
○ Both A and B
○ Neither

Answer: Both A and B

4. Mass is scalar or vector?

○ Scalar
○ Vector
○ Neither
○ Both

Answer: Scalar

5. Weight is scalar or vector?

○ Vector
○ Scalar
○ Neither
○ Both

Answer: Vector