# 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**