WORKSHEET 2

CHAPTER 3 – GRAVITATION

A. Tick (✓) the correct option.

1. The SI unit of universal gravitational constant is
   a. N m^2/kg^2. b. N^2 m/kg^2. c. N^2 m^2/kg. d. N m/kg^2.
2. Acceleration due to gravity at the centre of the earth is
   a. 9.8 m/s^2. b. 4.9 m/s^2. c. 0. d. none of these.
3. What is the mass of an object whose weight on earth is 196 N?
   a. 20 kg b. 0.20 kg c. 19.60 kg d. 2 kg
4. How much would a man, whose mass is 60 kg weigh on the moon?
   a. 9.8 N b. 600 N c. 60 N d. 98 N
5. SI unit of weight is
   a. Newton. b. kg. c. W. d. kg·W.

B. Fill in the blanks.

1. The mass of an object is the measure of its _____
2. The weight of a body is the force with which it is attracted towards the centre of the _____
3. At the centre of the earth, the weight of a body is _____
4. Mass of an object is 20 kg on earth. The mass of the same object on moon is _____
5. The weight of a body on earth is 600 N. The weight of the same body on the moon will be _____

C. State whether the given statements are true or false.

1. The force acting on a body due to gravity is called its mass.
2. The weight is equal to the product of mass and acceleration due to gravity.
3. Weight is a vector quantity.
4. Acceleration due to gravity on earth is $\frac{1}{6}$ th of that on the moon.
5. As we go below the surface of the earth, acceleration due to gravity goes on decreasing.

D. Match the following.

1. Force (F)	quantity of matter
2. Acceleration due to gravity (g)	6.67×10^{-11} N m^2/kg^2
3. Mass	$\frac{G\,Mm}{R^2}$
4. Gravitational constant	beam balance
5. Instrument used to measure mass	$\frac{G\,M}{R^2}$

Name: ..... Teacher's signature: .....

Class: IX Date: .....

E. Answer the following questions.

Very Short Answer Questions

1. Does the universal gravitational constant change with depth?
2. How does acceleration due to gravity changes as we go down below the surface of the earth?

Short Answer Questions

1. State the relation between acceleration due to gravity on moon and earth.
2. Define weight and give its SI unit.

Long Answer Questions

1. What are the characteristics of mass?
2. A ball is thrown up and attains a maximum height of 90 m. Calculate its initial speed (Take g = 10 m/s^2).

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. a 2. c 3. a 4. d 5. a

B. Fill in the blanks.

1. Inertia
2. Earth
3. Zero
4. 20 kg
5. 100 N

C. State whether the given statements are true or false.

1. F 2. T 3. T 4. F 5. T

D. Match the following.

1. Force (F)	$\frac{G\,Mm}{R^2}$
2. Acceleration due to gravity (g)	$\frac{G\,M}{R^2}$
3. Mass	quantity of matter
4. Gravitational constant	6.67×10^{-11} N m^2/kg^2
5. Instrument used to measure mass	beam balance

E. Answer the following questions.

Very Short Answer Questions

1. No, it is same at all places.
2. As we go down below the earth, acceleration due to gravity decreases.

Short Answer Questions

1. Acceleration due to gravity on the moon is $\frac{1}{6}$ th of that on earth.
2. The weight of a body is the force with which it is attracted towards the centre of the earth. Its SI unit is Newton (N).

Long Answer Questions

1. The characteristics of mass are:
   - Mass is scalar quantity.
   - The mass of an object does not change from place to place. It is constant.
   - The mass of a body can never be zero.
   - The mass of a body can be measured with the help of a two-pan balance.

2. $h = 90$ m

$u = ?$

$v = 0$

$g = 10$ m/s^2

We know,

$$v^2 = u^2 + 2gh$$

$$0 = u^2 + 2(-10)\ (90)$$

$$u^2 = 1800$$

$$u = \sqrt{1800}$$

$$= 42.42 \text{ m/s}$$

The initial speed with which the ball was thrown up is equal to 42.42 m/s.