CBSE

GRAVITATION WS 4

Class 09 - Science

Section A

1. Any object having sufficient positive energy can escape from the gravitational pull of the earth as **[1]**

   a) K.E. will be more to escape the gravitational potential energy
   b) K.E. is negative otherwise
   c) Negative energy means it is bound
   d) P.E. is positive for total energy being positive

2. Priya buys a bag of sugar of weight W at a place on the equator. She takes it to Antarctica. The weight of a sugar bag at Antarctica **[1]**

   a) Remains same as the weight at a place on equator
   b) Cannot be said
   c) Decreases
   d) Increases

3. The weight of an object at the center of the earth of radius R is **[1]**

   a) $\frac{1}{R^2}$ times the weight at surface of the earth
   b) zero
   c) infinite
   d) R times the weight at the surface of the earth

4. The weight of a body felt in tap water and salty water are W_A and W_B respectively, then : **[1]**

   a) $W_A = W_B$
   b) $W_A > W_B$
   c) $W_A < W_B$
   d) $W_B = 2W_A$

5. Even though stone also attracts earth towards itself, the earth does not move: **[1]**

   a) Force exerted by stone is less
   b) Because of lesser mass of stone
   c) Because of greater mass of earth
   d) Force exerted earth is large

6. The mass of body is 10 kg at a place where g = 10 m/s^2, its weight is **[1]**

   a) 100 N
   b) 1000 N
   c) 10 N
   d) 1 N

7. The amount of heat energy lost by hot body in a given time depend on: **[1]**

   a) all of these
   b) the area of its surface
   c) the temperature of its surface
   d) the nature of the surface

8. The weight of an object has S.I. unit of: **[1]**

   a) Newton
   b) N/kg

c) kg/N

d) kg

9. Earth goes round the Sun with **[1]**

a) same velocity

b) varying K.E.

c) same momentum

d) varying velocity

10. Which of the following is the evidence to show that there must be a force acting on the earth and directed towards the sun **[1]**

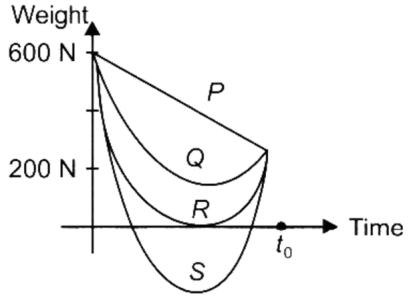
a) deviation of falling bodies towards the east

b) apparent motion of sun around the earth

c) revolution of the earth around the sun

d) phenomenon of day and night

11. Suppose, the acceleration due to gravity at the Earth's surface is 10 m $s^{-2}$and at the surface of Mars is 4 m s^{-2}. A 60 kg passenger goes from the Earth to the Mars in a spaceship moving with a constant velocity. Neglect all other objects in the sky. Which part of figure best represents the weight (net gravitational force) of the passenger as a function of time? **[1]**



a) S

b) R

c) P

d) Q

12. A 60 kg man weight W kg on the moon. W is **[1]**

a) 10 kg

b) 60 kg

c) 5 kg

d) 70 kg

13. The ratio of weight to mass of the body is _____. **[1]**

a) zero

b) 9.8

c) 1.0

d) 10

14. The weight of an object is **[1]**

a) Equal on both earth and Moon

b) Lesser on earth and Greater on earth

c) Not equal on both earth and Moon

d) Greater on earth and lesser on Moon

15. A heavier and a lighter body have equal momentum, then **[1]**

a) heavier will have more K.E.

b) lighter will have more K.E.

c) they will have equal K.E.

d) K.E. will be independent of momentum

16. **Assertion (A):** Weight of an object is the force with which a body attracted towards the earth. **[1]**
Reason (R): Its direction is vertically upwards.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

17. **Assertion (A):** When the orbital radius of a planet is made 4 times, its time period increases by 8 times. **[1]**

Reason (R): Greater the height above the earth's surface, greater is the time period of revolution.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

18. **Assertion (A):** A spring balance that shows the weight of a body to be 6 N on earth will show a weight of only 1 N when taken to the moon. **[1]**

Reason (R): The weight of an object on the moon will be about one-sixth of what is on the earth.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

19. **Assertion (A):** The weight of a body on earth is equal to the force with which the body is attracted towards the earth. **[1]**

Reason (R): The weight of a body is independent of the mass of the body.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** The weight of an object on the moon is less than that on the earth. **[1]**

Reason (R): The mass and radius of the moon are less than that of earth.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

21. **Assertion (A):** The force of attraction of the earth on an object is known as the weight of the object. **[1]**

Reason (R): The SI unit of weight is the joule (J).

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

22. If the acceleration due to gravity at a place is more, the weight of that object will _____. **[1]**

a) Decrease

b) Remains same

c) None of these.

d) Increase

23. The astronauts in space feel weightless. Why? **[1]**

24. Mass of an object is 10 kg. What is its weight on the earth? **[1]**

25. An object weighs 10 N when measured on the surface of the earth. What would be its weight when measured on the surface of the moon? **[1]**

26. A man's weight when taken at the poles is 600N. Will is weight remain the same when measured at the equator? Will there be an increase or decrease is his weight? Explain. **[1]**

27. The weight of a man on the earth is 100 kg. Does this weight on the moon increase or decrease? **[1]**

Section B

28. **Fill in the blanks:** **[2]**

(a) The weight of an object on the moon will be about _____ of what is on the earth. **[1]**

(b) SI unit of weight is _____. **[1]**

29. Find the percentage change in the weight of a body, when it is taken from the equator to poles. The radius of the earth at poles is 6357 km and the radius at the equator is 6378 km. **[2]**

30. A bag of sugar weighs W at some place on the equator. If this bag is taken to Antarctica, will it weigh same, more or less? Give a reason for your answer. **[2]**

31. Why is the weight of an object on the moon $\frac{1}{6}$th its weight on the earth? **[2]**

32. Suppose that the radius of the earth becomes twice of its original radius without any change in its mass. Then what will happen to your weight? **[2]**

33. Why is the weight of an object on the moon $1/6^{th}$ its weight on the earth? **[2]**

34. On a certain planet, a small stone tossed up at 15 m/s vertically uploads takes 7.5 s to return to the ground. What is the acceleration due to gravity on the planet? **[2]**

35. In what sense does the moon fall towards the earth? Why does it not actually fall on the surface of Earth? **[2]**

36. Gravitational force on the surface of the moon is only $\frac{1}{6}$ as strong as gravitational force on the earth. What is the weight in newtons of a 10 kg object on the moon and on the earth? **[2]**

37. Gravitational force on the surface of the moon is only 1/6 as strong as gravitational force on the earth. What is the weight in newton of a 10 kg object on the moon and on the earth? **[2]**

Section C

38. The radius of earth is 6370 Km and of mars is 3400 Km. If an object weighs 200N or earth, what will be its weight on mars. The mass of mars is 0.11 that of earth. **[3]**

39. Amit buys few grams of gold at the poles as per the instruction of one of his friends. He hands over the same when he meets him at the equator. Will the friend agree with the weight of gold bought? If not, why? **[3]**

Section D

40. The weight of any person on the moon is about 1/6 times that on the earth. He can lift a mass of 15 kg on the earth. What will be the maximum mass, which can be lifted by the same force applied by the person on the moon? **[5]**

41. What are the differences between the mass of the object and its weight? **[5]**