

Sample Paper
Class 9 CBSE 2020-21

General Instructions

- (i) The question paper comprises four sections A, B, C, and D. There are 36 questions in the question paper. All questions are compulsory.
- (ii) (Section-A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple-choice questions (MCQs), very short answer questions, and assertion - reason type questions. Answers to these should be given in one word or one sentence.
- (iii) Section-B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (iv) Section-C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (v) Section-D - question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
- (vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (vii) Wherever necessary, neat, and properly labelled diagrams should be drawn.

Section-A



1. Give one example each for
 - Aerosol
 - Emulsion

OR

Is it possible for the atom of an element to have one electron, one proton and no neutron? If so, name the element.

2. A group of atoms carrying a fixed charge on them is called _____.
3. Which one of the following is not a chemical change?
 - A. Formation of curd
 - B. Ripening of banana
 - C. Sublimation of naphthalene
 - D. Corrosion of photo frame
4. What is meant by uniform circular motion? Name the force required to keep a body moving uniformly along a circular path
5. Define average speed, write any one point of difference between average speed and average velocity.
6. Which of the two, balanced forces or unbalanced forces, can change the shape of an object? Give an example to illustrate your answer.

OR

Describe the term 'inertia' with respect to motion.

7. A body has a weight of 10 kg on the surface of earth. What will be its weight when taken to the centre of the earth?
8. Calculate the work done when a force of 15 N moves a body by 5 m in its direction.
9. An object undergoes acceleration of 8m/s^2 starting from rest. Find the distance travelled in one second.

OR

A bus in motion increases its speed from 30kmh^{-1} to 60kmh^{-1} in 20 seconds. Find its acceleration.

10. Which of the following can be crystallized?
 - a. An amoeba
 - b. A sperm
 - c. A virus
 - d. A bacterium
11. Who discovered vaccination?
12. State the role of atmosphere in climate control?

13. Name the contractile proteins present in the nucleus.
14. **Direction:** In the following questions, a statement of assertion (A) is followed by a statement of the reason (R).
- Assertion:** The formula of sodium carbonate is Na_2CO_3 .
- Reason:** While writing the formula of a compound, the valencies of the cation and anion are crossed.
- A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of the assertion
- B. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A)
- C. Assertion (A) is true but reason (R) is false.
- D. Assertion (A) is false but reason (R) is true.
15. **Assertion(A):** Human cells are not affected by the antibiotics
- Reason(R):** The antibiotics penicillin blocks the bacterial biochemical process that builds the cell wall.
- A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of the assertion
- B. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A)
- C. Assertion (A) is true but reason (R) is false.
- D. Assertion (A) is false but reason (R) is true.
16. **Assertion:** The displacement of a stone thrown up or down from a tower will be the same as they reach the ground.
- Reason:** Distance travelled by the stone thrown up is more than the distance travelled by the stone thrown down
- A. Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of the assertion
- B. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A)
- C. Assertion (A) is true but reason (R) is false.
- D. Assertion (A) is false but reason (R) is true.
17. Answer questions numbers (a) to (d) based on your understanding of the following paragraph and related studied concepts:



Recently it was discovered that this ozone layer was getting depleted. Various man-made compounds like CFCs (carbon compounds having both fluorine and chlorine which are very stable and not degraded by any biological process) were found to persist in the atmosphere. Once they reached the ozone layer, they would react with the ozone molecules. This resulted in a reduction of the ozone layer and recently they have discovered a hole in the ozone layer above Antarctica. It is difficult to imagine the consequences for life on Earth if the ozone layer dwindles further, but many people think that it would be better not to take chances. These people advocate working towards stopping all further damage to the ozone layer.

- What is the role of the ozone layer in our atmosphere?
- What human activities increase/decrease the ozone hole?
- Why are some people advocating to protect the ozone layer?
- Has the lockdown due to the current pandemic brought any change in the ozone hole?

18. Read the following and answer any **four** questions from (i) to (v)

Sudha tested the solubility of four salts X, Y, Z and T at different temperatures and collected the following data.

(Solubility refers to the amount in grams dissolved in 100 g of water to give a saturated solution).

Salt dissolved	Temperature in Kelvin				
	290 K	313 K	323K	343K	353K
	Solubility				
X	22	34	40	93	109
Y	43	43	46	50	50
Z	27	30	34	37	40
T	25	38	42	54	64

Answer the following questions from the table :

- Which salt has the highest and lowest solubility at 323 K?
- A student prepared a saturated solution of X at 323 K and then added 25 g water to it. What mass of X must be added to again make the solution saturated?
- The solubility of which salt is least affected by the increase in temperature?
- What mass of 'T' would be required to make a saturated solution in 200 g of water at 290 K?



- (v) What mass of Z is required to make a saturated solution at 313 K?
19. Read the following and answer any **four** questions from (a) to (e)
Give the formulae of the compounds formed from the following sets of elements:
- (a) calcium and fluorine
 - (b) hydrogen and sulphur
 - (c) nitrogen and hydrogen
 - (d) carbon and chlorine
 - (e) sodium and oxygen
20. Read the following and answer any **four** questions from (a) to (e)
Consider the motion of a batsman in a cricket game. The length of the pitch is 18 m. Suppose the batsman completes one run and he is now 18 m away from his batting crease or his starting point. Then he turns back and gets run out, when he is exactly mid-way through his second run.
- (a) Is the batsman going through uniform or non-uniform motion for the whole journey?
 - (b) If the batsman runs one run in 5 seconds, then what was his speed?
 - (c) The total distance travelled by batsman is
 - A. 18 m
 - B. 36 m
 - C. 9 m
 - D. 27 m
 - (d) How far is the batsman from his starting point?
 - (e) What is the net displacement of the batsman?

Section-B

21. State four important functions of golgi apparatus.

OR

- a. Name the greenhouse gases.
 - b. What causes global warming?
22. Identify the type of tissue in the following:
- a. Vascular bundle
 - b. Inner lining of the intestine



- c. Lining of kidney tubule
- d. Iris of the eye

23. State which of the following solutions exhibit the Tyndall effect :
The starch solution, Sodium chloride solution, Tincture of iodine, Air.

OR

The electronic configuration of the phosphorus atom is 2, 8, 5. Give the electronic configuration of P^{3-} ion.

- 25. If a body of mass 3 kg is dropped from a tower of height of 25 m. Then what is its kinetic energy at the moment it hits the ground?
- 26. A dumbbell with a mass of 20kg has been dropped from a height of 100m. What is the amount of kinetic energy in the dumbbell after three seconds?

Section-C

27. Distinguish between:
- a. Symptoms and signs
 - b. Carrier and vectors

OR

What is the difference between the plasma membrane and cell wall?
Give the functions of each one.

28. State one important function of each of the following:
- a. Glandular epithelium
 - b. Nervous tissue
 - c. Cuboidal epithelium
29. Write a short note on the pulse polio programme.
30. (i) The motion of the earth around the sun once in a year requires some force of attraction between them. What is the source of centripetal force acting between them? (1 mark)
- (ii) Rama drives in a uniform circular motion describing a circle of radius of 7 km. if it takes 2 hours to complete one round. Tts speed is (Take $\pi = 22/7$) (2)
31. Classify the following into elements, compounds and mixtures.
- (i) Pure sand
 - (ii) Air



- (iii) Ammonia gas
 - (iv) Ice
 - (v) Glass
 - (vi) CaO.
32. List any three distinguishing features between the models of an atom proposed by J.J. Thomson and Ernest Rutherford.
33. (i) A ball of mass 2 kg strikes a wall with a speed of 2 m/s and is bounced back with the same speed. It remained in contact with the wall for 0.01 seconds. What is the impulse exerted on the wall? Assume no energy is lost during collision with the wall.
- (ii) What is the difference between the initial and final momentum of 2 bodies in straight line collision when no external force acts on either?

Section-D

34. Complete the following gaps in the given table:

Elements	Protons	Electrons	Neutrons	Atomic Number	Mass Number
A	—	—	10	8	—
B	15	—	—	—	31
C	1	—	—	—	3
D	—	11	12	—	—

OR

- (a) State six postulates of Dalton's atomic theory.
 - (b) A 0.24 g sample of a compound of carbon and oxygen on analysis was found to contain 0.096 g of carbon and 0.144 g of oxygen. Find the percentage composition of the compound by weight.
35. (a) Draw a neat diagram of the section of the tissue that is responsible for translocation of food from the leaves to different parts of the plants and explain about its components briefly.
- (b) There are small pores on the epidermis (outer layer) of plant parts. Name them.
36. (i) Explain the transformation of energy in the following cases: (a) A ball thrown upwards. (b) A stone dropped from the roof of a building.
- (ii) When do we say that work is done? Write the formula for the work done by a body in moving up against gravity.
- (iii) How much work is done when a force of 2 N moves a body through a distance of 10 cm in the direction of force?



Hints & Solutions

Section-A

1. **Solution:**

- Aerosol: Clouds
- Emulsion: Milk.

OR

Solution: Yes, it is true for the hydrogen atom.

2. **Solution:** Polyatomic ion

3. **Solution:** C

The sublimation of naphthalene is not a chemical change as it is reversible.

4. **Solution:** Uniform circular motion: When a body moves in a circular path with uniform speed (constant speed), its motion is called uniform circular motion. This force, required to keep a body moving uniformly along a circular path is called **Centripetal Force**.

5. **Solution:** Average speed of the object in an interval of time is the distance travelled by the object divided by the duration of interval of time. Average speed is a scalar quantity while average velocity is a vector quantity.

6. **Solution:** Balanced forces can change the shape of the object.

Example: Squeeze a rubber ball between the palms of your hands. What do you observe? The shape of the rubber ball changes. The force applied on the ball is equal and opposite, so, the resultant of this force does not move the object, this is a balanced force.

OR

Inertia can easily be described as the reluctance or resistance of a body to change its state of motion i.e. if a body is at rest, it will continue to remain at rest if an external force is not applied to change its state of rest whereas if a body is in motion, it will continue to remain in motion if an external force is not applied to change its state of motion.



7. **Solution:** When the body is taken to the centre of the earth, its weight will be reduced to zero as the value of the g is zero at the centre of the earth. This is because the body is pulled equally on all sides by masses all around it.

8. **Solution:** We know that the work done by a force on an object in the direction of motion is given as

Work done = Force \times Displacement

Given

Force = 15 N

Displacement = 5 m

Work done = $15 \times 5 = 75$ J

9. **Solution:** Here, $u = 0$, $a = 8 \text{ m/s}^2$, $t = 1$ s. From second equation of motion

$$S = ut + \frac{1}{2}at^2$$
$$S = 0 \times 1 + \frac{1}{2} \times 8 \times 1^2 = 4 \text{ m}$$

OR

The rate of change of velocity is said to be the acceleration of the body. It is mathematically described as;

The quantity is given km/hr. Converting it into the SI unit

1 km/h = $1000/3600$ m/s

$$a = \frac{v - u}{t} = \frac{60 - 30}{20} \times \frac{1000}{3600} = 0.42 \text{ m/s}^2$$

10. **Solution:** (c) Viruses behave as non-living outside the cells of the host.

11. **Solution:** The process of vaccination was developed by Edward Jenner

12. **Solution:** Atmosphere prevents sudden heating during sunshine. It also slows down the escape of heat into outer space during nighttime.

13. **Solution:** Contractile proteins namely actin and myosin facilitates movement in muscles.

14. **Solution:** A

15. **Solution:** (a) Hence, antibiotics work against bacterial infections.

16. **Answer:** B

Solution: Displacement is the shortest distance travelled therefore it remains the same for the stone thrown upwards and downwards, but when it is combined, the displacement becomes zero.

17. **Solution:** (a) The ozone layer in the higher layer of atmosphere, absorbs harmful UV radiations from the sun so they do not reach the earth's surface.

(b) Excessive use of man-made compounds like CFCs damage the ozone layer resulting in formation of ozone holes.

(c) Some people are advocating to protect the ozone layer because excessive UV radiation can lead to skin cancer and threat to living beings.

(d) In the current Pandemic, due to lockdown, the human activities are reduced. This has led to less population and it has been noticed through satellite images that the ozone hole over Antarctica has healed considerably

18. **Solution:**

(i) At 323 K, salt Y has the highest solubility in water while salt Z has the lowest solubility

(ii) By definition of saturated solution,

100 g of water at 323 K contain salt = 40 g

125 g of water at 323 K contain salt = $\frac{(40\text{g})}{(100\text{g})} \times (125\text{g}) = 50\text{g}$

\therefore Mass of salt to be added to make the solution again saturated = $(50 - 40) = 10\text{g}$

(iii) The data shows that the solubility of the salt Y is least affected with increase in temperature.

(iv) At 290 K, mass of T required to make the saturated in 200 g of water = $\frac{(25\text{g})}{(100\text{g})} \times (200\text{g}) = 50\text{g}$

(v) 30 g is required to make a saturated solution at 313 K.

19. **Solution :**

(a) The valency of calcium is 2 and that of fluorine is -1. So according to the valencies of both the elements, the formula becomes CaF_2 .

(b) The valency of hydrogen is 1 and that of sulphur is -2. So according to the valencies of both the elements, the formula becomes H_2S .

(c) The valency of nitrogen is -3 and that of hydrogen is 1. So according to the valencies of both the elements, the formula becomes NH_3 .

(d) The valency of carbon is 4 and that of chlorine is -1. So according to the valencies of both the elements, the formula becomes CCl_4 .



- (e) The valency of sodium is 1 and that of oxygen is -2. So according to the valencies of both the elements, the formula becomes Na_2O .
20. (a) **Solution:** Since the batsman changes his direction, we can say that he goes through non-uniform motion
- (b) **Solution:** The length of the pitch is 18m, then the speed of the batsman can be calculated as
- $$v = \frac{18}{5} = 3.6 \text{ m/s}$$
- (c) **Answer:** D
- Solution:** The total distance travelled by the batsman is $18+9 = 27$ m
- (d) **Solution:** He was run out mid-way on the pitch, therefore he is at a distance of $18-18/2 = 9$ m from the starting point.
- (e) **Solution:** Displacement is defined as the shortest distance between initial and final point, therefore displacement = $18-18/2 = 9$ m

Section-B

21. **Solution:**
- i. Golgi apparatus plays a vital role in storage, modification, packaging and secretion of the material synthesized by ER through vesicles
 - ii. They are involved in the formation of lysosomes
 - iii. It is also known to play an important role in the formation of cell walls during replication and growth.
 - iv. It is an important link in the secretory pathway of the cell.

OR

Solution:

- a. Carbon dioxide (CO_2), methane (CH_4), ozone (O_3) and water vapour (H_2O) are the greenhouse gases.
 - b. The greenhouse gases do not allow heat rays to escape from the earth resulting in an increase of temperature of the earth. Hence, greenhouse gases cause global warming.
22. **Solution:**
- a. Vascular bundle: Complex plant tissue namely xylem and phloem constitute vascular bundle.



- b. Inner lining of the intestine: Columnar epithelium is present in the inner lining of intestine.
- c. Lining of kidney tubule: Cuboidal epithelium occurs in the lining of kidney tubules.
- d. Iris of the eye: Un-striated muscular tissue occurs in the iris of the eye.

23. **Solution:**

1. Tyndall effect is shown both by starch solution and air which are heterogeneous mixtures and have the capacity to scatter a beam of light as it passes through them.
2. Sodium chloride solution and tincture of iodine (iodine crystals dissolved in ethyl alcohol) are both homogeneous in nature and do not exhibit any Tyndall effect.

OR

Solution:

Electronic configuration of P = 2, 8, 5

P atom gains 3e⁻ to form P³⁻

∴ P³⁻ has configuration = 2, 8, (5 + 3) = 2, 8, 8

24. **Solution:**

One mole of hydrogen weighs = 1 g

∴ 6.02 × 10²³ atoms of hydrogen weigh = 1 / (6.02 × 10²³)

∴ 1 atom of hydrogen weighs = 1.66 × 10⁻²⁴ g

25. **Solution:** The ball is dropped from the height of 25 m from the top of a tower.

The initial velocity of the ball is 0.

The final velocity of the ball,

$$v^2 - u^2 = 2gs$$

$$v^2 = 2 \times 10 \times 25 = 500$$

Now the kinetic energy is given as,

$$\frac{1}{2}mv^2 = \frac{1}{2} \times 3 \times 500 = 750 J$$

26. **Solution:** Since the stone starts at rest (it has an initial velocity of zero), its velocity at any time is given as

$$v = u + gt$$

$$\Rightarrow v = gt$$



At a time of three seconds, the velocity towards the ground is thus:

$$v = 9.81 \times 3 = 29.43 \text{ m/s}$$

It's kinetic energy at three seconds is therefore:

$$KE = \frac{1}{2}mv^2$$

$$KE = \frac{1}{2} \times 20 \times (29.43)^2 = 8661 \text{ J}$$

Section-C

27. **Solution:**

a.

Symptoms	Signs
Symptoms are the manifestation of the disease	Signs are the definite indication of the disease
Symptoms are in the form of structural and function changes in the body or body parts	On the basis of symptoms physicians search for definite clues or signs of the disease
They do not give exact cause of the disease	Instruments and lab tests pinpoint the cause of disease

b.

Carrier	Vectors
An organisms that harbours germs of a disease	Vectors are organisms which spread the pathogen from an infected person to a healthy person. Usually a part of the lifecycle of pathogen is spent in the body of the vector
They are not specific	They are specific
Example: Housefly	Example: Female anopheles mosquito spreads malaria

OR

Solution: Difference between plasma membrane and cell wall:

Plasma membrane	Cell wall

It is found in both plants and animal cells	It occurs on plant cells
Plasma membrane is thin, flexible and selectively permeable.	Cell wall is thick, rigid and permeable in nature
It is formed of proteins and lipids	It is formed of cellulose, hemicellulose and pectin
It holds cellular contents and controls the exit and entry of water and selected solute molecules	It provides protection as well as giving mechanical strength to the cell.

28. **Solution:**

- a. **Glandular epithelium:** Sometimes epithelial tissue exhibits inward foldings to form a multicellular gland which produces secretions like tears, mucus, gastric juice, intestinal juice and so on. Such an epithelium is referred to as glandular epithelium
- b. **Nervous tissue:** It coordinates the functioning of different body parts. It not only picks up sensations of all types but also provides response to all types of stimuli by transmitting impulses.
- c. **Cuboidal epithelium:** An epithelium which is composed of compantly arranged cells and appears squarish in vertical section and occurs in uriniferous tubules, germinal layers of sex organsm thyroid vesciles, small salivar and pancreatic ducts. Cuboidal epithelium takes part in secretion, excretion and absorption.

29. **Solution:** Pulse polio programme is a programme to eradicate polio through mass immunisation of children. It was launched in 1995-96 to cover all the children below the age of 3 years. In order to accelerate the pace of polio eradication, the target age group were children under the age of 5 years. A legendary actor Amitabh Bachhan is the branch ambassador of this health programme. In this programme awareness about the polio disease caused by a virus was made. Polio drops are given to children twice a year. This programme is continuing till date due to occurrence of a few stray polio cases in 2009. So it has been extended so as to completely wipe out this disease from our country. Due to continued efforts, our country is now polio-free

30. **Solution:**



- (i) Centripetal force is the force acting towards the centre of a circle. The gravitational force between the sun and the earth provides the necessary centripetal force.
- (ii) Rama drives in a uniform circular motion describing a circle of radius of 7 km. if it takes 2 hours to complete one round. Tts speed is (Take $\pi = 22/7$)

The speed of the body moving in a uniform circular motion is given as;

$$v = \frac{2\pi r}{t}$$

Where v is the velocity of the moving body, r is the radius of the circle and t is the total time taken by the body.

In the question it is given $t = 2$ hours, $r = 7$ km.

$$v = \frac{2 \times \frac{22}{7} \times 7}{2 \text{ hr}} = 22 \text{ km/hr}$$

Thus, the speed of the body is 22 km/hr

31. **Solution:**

Elements – Nil

Compounds – Pure sand, Ice, CaO, Ammonia gas

Mixture – Air, Glass.

32. **Solution:**

J. J. Thomson Model of Atom	Rutherford's Model
1. Positive charge forms a base of the spheres.	1. Nucleus (positive charge) is in the center.
2. Electrons present throughout the atom.	2. Electrons revolve in orbits.
3. No space is empty.	3. Most of the space is empty.

33. **Solution:**

- (i) Impulse is defined as the change in momentum of the object. After bouncing back, the direction of ball is reversed, and the magnitude of velocity remains the same. Then, considering the final direction of the ball to be positive.

$$I = m(v - u) = 2 \times (2 - (-2)) = 8 \text{ kg m/s}$$

(ii) When no external force acts on either body involved in a straight-line collision then law of conservation of momentum holds true.

According to the law, momentum before and after collision is conserved so their difference will be zero.

Section-D

34. **Solution:** We know that the number of protons = Atomic number

Number of protons = Number of electrons

Mass number = Number of protons + number of neutrons

Using these relationships, we can fill up these gaps as follows:

Elements	Protons	Electrons	Neutrons	Atomic Number	Mass Number
A	8	8	10	8	18
B	15	15	16	15	31
C	1	1	2	1	3
D	11	11	12	11	23

OR

Solution:

(a) The important features of Dalton's Atomic Theory are listed :

1. Every matter is made up of very small particles known as atoms.
2. Atoms are the ultimate particles of matter and cannot be further subdivided into smaller particles.
3. Atoms can neither be created nor destroyed during a physical change or a chemical reaction.
4. All atoms of a particular element are identical in all respects. This means that they have the same mass, size and also same chemical properties.
5. Atoms of different elements have different masses, sizes and also chemical properties.
6. Atoms are the smallest particles of matter which can take part in chemical combinations.
7. Atoms of the same or different elements combine in small whole-number ratios to form molecules of a compound.



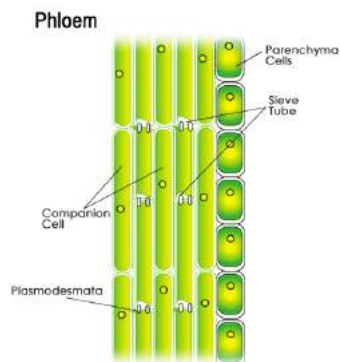
$$\text{Percentage of carbon} = \frac{\text{Mass of carbon}}{\text{Mass of compound}} \times 100 = \frac{(0.096 \text{ g})}{(0.24 \text{ g})} \times 100 = 40\%$$

$$\text{Percentage of oxygen} = \frac{\text{Mass of oxygen}}{\text{Mass of compound}} \times 100 = \frac{(0.144 \text{ g})}{(0.24 \text{ g})} \times 100 = 60\%.$$

(b)

35. **Solution:**

- a. The complex tissue in plants that is actively involved in translocation of manufactured food from leaves to various organs in the plant body is referred to as phloem. Phloem is made of four types of elements - Sieve tubes, companion cells, phloem parenchyma and phloem fibres. The first three treacherly elements of phloem are living whereas phloem fibres is the only non-living component of phloem. **Sieve tubes** are elongated tubular channels formed of large numbers of thin walled sieve tube cells placed end to end in linear rows. The transverse end walls between adjacent sieve tubes are perforated and are referred to as sieve plates. **Companion Cells** are thin walled cells which lie adjacent to the sieve tube cells. They have dense cytoplasm with prominent nucleus. **Phloem parenchyma** tissues have certain parenchymatous cells associated with it which are thin, living and perform two major functions - storage and lateral conduction of food. **Phloem fibres** are thick walled, elongated spindle shaped dead cells with narrow lumen. They provide mechanical strength to the tissue.



- b. Stomata are the minute pores present on the epidermal layer of plant parts through which exchange of gases as well as loss of water in the form of vapours takes place.

36. **Solution:**

- (i) (a) When a ball is thrown up, all of its kinetic energy is converted into potential energy at the top point.
- (b) When a stone is drop from certain height all of its potential energy at that height is converted into kinetic energy just above the ground
- (ii) Work is said to be done under the following conditions:
- When a force acts on a body
 - When there is displacement of the body that is caused by the applied force along the direction of the applied force .i.e., object is displaced

Formula for the work done by a body in moving up against gravity

Work done = mgh ,

Where m is mass, g is acceleration due to gravity and h is height.

(iii) Given, $F=2N$, distance travelled by the body= $10cm=0.1m$

$W = F \times d$

$= 2N \times 0.1m = 0.2J$

Work done = $0.2J$

