ÉCOLE GLOBALE
INTERNATIONAL GIRLS SCHOOL
Dehradun

HOLIDAYS HOMEWORK **SUMMER BREAK 2018-19**
CLASS IX B CBSE **SUBJECT: SCIENCE**

PHYSICS

1. An object has moved through a distance. Can it have zero displacement? If yes, support your answer with an example.
2. A farmer moves along the boundary of a square field of side 10 m in 40 s. What will be the magnitude of displacement of the farmer at the end of 2 minutes 20 seconds?
3. Which of the following is true for displacement?
   (a) It cannot be zero.
   (b) Its magnitude is greater than the distance travelled by the object.
4. An object travels 16 m in 4 s and then another 16 m in 2 s. What is the average speed of the object?
5. Distinguish between speed and velocity.
6. Under what condition(s) is the magnitude of average velocity of an object equal to its average speed?
7. What does the odometer of an automobile measure?
8. What does the path of an object look like when it is in uniform motion?
9. During an experiment, a signal from a spaceship reached the ground station in five minutes. What was the distance of the spaceship from the ground station? The signal travels at the speed of light, that is, 3×10^8 m s^{-1}.
10. The odometer of a car reads 2000 km at the start of a trip and 2400 km at the end of the trip. If the trip took 8 h, calculate the average speed of the car in kmh^{-1} and ms^{-1}.
11. Usha swims in a 90 m long pool. She covers 180 m in one minute by swimming from one end to the other and back along the same straight path. Find the average speed and average velocity of Usha.
12. Starting from a stationary position, Rahul paddles his bicycle to attain a velocity of 6 ms^{-1} in 30 s. Then he applies brakes such that the velocity of the bicycle comes down to 4 ms^{-1} in the next 5 s. Calculate the acceleration of the bicycle in both the cases.
13. When will you say a body is in (i) uniform acceleration? (ii) non-uniform acceleration?
14. A bus decreases its speed from 80 km h^{-1} to 60 km h^{-1} in 5 s. Find the acceleration of the bus.
15. A train starting from a railway station and moving with uniform acceleration attains a speed 40 km h^{-1} in 10 minutes. Find its acceleration.
16. What is the nature of the distance-time graphs for uniform and non-uniform motion of an object?
17. What can you say about the motion of an object whose distance-time graph is a straight line parallel to the time axis?
18. What can you say about the motion of an object if its speed-time graph is a straight line parallel to the time axis?
19. What is the quantity which is measured by the area occupied below the velocity-time graph?
20. A train starting from rest attains a velocity of 72 km h^{-1} in 5 minutes. Assuming that the acceleration is uniform, find (i) the acceleration and (ii) the distance travelled by the train for attaining this velocity.

21. A car accelerates uniformly from 18 km h^{-1} to 36 km h^{-1} in 5 s. Calculate (i) the acceleration and (ii) the distance covered by the car in that time.

22. The brakes applied to a car produce an acceleration of 6 m s^{-2} in the opposite direction to the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance it travels during this time.

23. A bus starting from rest moves with a uniform acceleration of 0.1 m s^{-2} for 2 minutes. Find (a) the speed acquired, (b) the distance travelled.

24. A train is travelling at a speed of 90 km h^{-1}. Brakes are applied so as to produce a uniform acceleration of – 0.5 m s^{-2}. Find how far the train will go before it is brought to rest.

25. A trolley, while going down an inclined plane, has an acceleration of 2 cm s^{-2}. What will be its velocity 3 s after the start?

26. A racing car has a uniform acceleration of 4 m s^{-2}. What distance will it cover in 10 s after start?

27. A stone is thrown in a vertically upward direction with a velocity of 5 m s^{-1}. If the acceleration of the stone during its motion is 10 m s^{-2} in the downward direction, what will be the height attained by the stone and how much time will it take to reach there?

28. An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at the end of 2 minutes 20 s?

29. Joseph jogs from one end A to the other end B of a straight 300 m road in 2 minutes 50 seconds and then turns around and jogs 100 m back to point C in another 1 minute. What are Joseph's average speeds and velocities in jogging (a) from A to B and (b) from A to C?

30. Abdul, while driving to school, computes the average speed for his trip to be 20 km h^{-1}. On his return trip along the same route, there is less traffic and the average speed is 40 km h^{-1}. What is the average speed for Abdul's trip?

31. A motorboat starting from rest on a lake accelerates in a straight line at a constant rate of 3.0 m s^{-2} for 8.0 s. How far does the boat travel during this time?

32. A driver of a car travelling at 52 km h^{-1} applies the brakes and accelerates uniformly in the opposite direction. The car stops in 5 s. Another driver going at 3 km h^{-1} in another car applies his brakes slowly and stops in 10 s. On the same graph paper, plot the speed versus time graphs for the two cars. Which of the two cars travelled farther after the brakes were applied?

33. Fig 8.11 shows the distance-time graph of three objects A,B and C. Study the graph and answer the following questions:

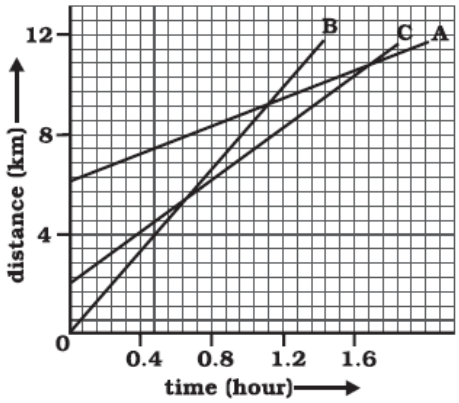

Fig. 8.11

(a) Which of the three is travelling the fastest?
(b) Are all three ever at the same point on the road?
(c) How far has C travelled when B passes A?
(d) How far has B travelled by the time it passes C?

34. A ball is gently dropped from a height of 20 m. If its velocity increases uniformly at the rate of 10 m s^{-2}, with what velocity will it strike the ground? After what time will it strike the ground?

35. The speed-time graph for a car is shown is Fig. 8.12.

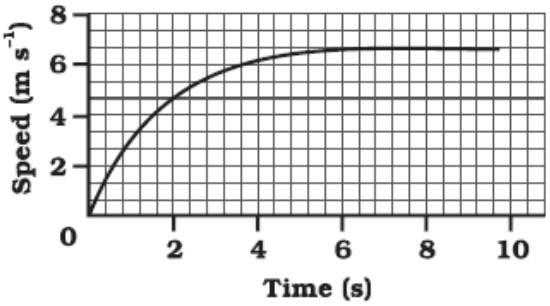

Fig. 8.12

(a) Find how far does the car travel in the first 4 seconds. Shade the area on the graph that represents the distance travelled by the car during the period.

(b) Which part of the graph represents uniform motion of the car?

36. State which of the following situations are possible and give an example for each of these:

(a) an object with a constant acceleration but with zero velocity

(b) an object moving in a certain direction with an acceleration in the perpendicular direction.

37. An artificial satellite is moving in a circular orbit of radius 42250 km. Calculate its speed if it takes 24 hours to revolve around the earth.

38. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify you answer.

39. How will the equations of motion for an object moving with a uniform velocity change?

40. A girl walks along a straight path to drop a letter in the letterbox and comes back to her initial position. Her displacement–time graph is shown in Fig.8.4. Plot a velocity–time graph for the same.

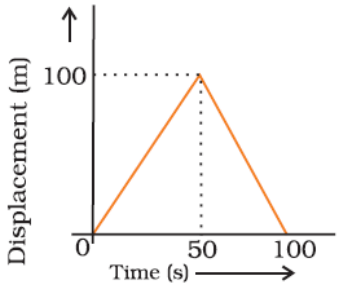

Fig. 8.4

41. A car starts from rest and moves along the x-axis with constant acceleration 5 m s^{-2} for 8 seconds. If it then continues with constant velocity, what distance will the car cover in 12 seconds since it started from the rest?

42. A motorcyclist drives from A to B with a uniform speed of 30 km h^{-1} and returns back with a speed of 20 km h^{-1}. Find its average speed.

43. The velocity-time graph (Fig. 8.5) shows the motion of a cyclist. Find (i) its acceleration (ii) its velocity and (iii) the distance covered by the cyclist in 15 seconds.

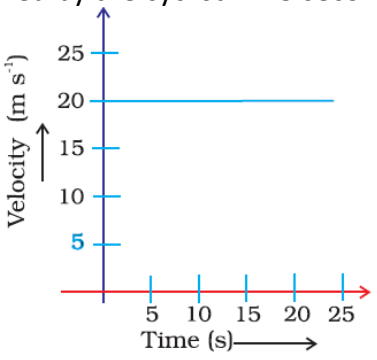

Fig. 8.5

44. Draw a velocity versus time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.

45. An object is dropped from rest at a height of 150 m and simultaneously another object is dropped from rest at a height 100 m. What is the difference in their heights after 2 s if both the objects drop with same accelerations? How does the difference in heights vary with time?

46. An object starting from rest travels 20 m in first 2 s and 160 m in next 4 s. What will be the velocity after 7 s from the start.

47. Using following data, draw time - displacement graph for a moving object:

Time (s)	0	2	4	6	8	10	12	14	16
Displacement (m)	0	2	4	4	4	6	4	2	0

Use this graph to find average velocity for first 4 s, for next 4 s and for last 6 s.

48. An electron moving with a velocity of 5×10^4 m s^{-1} enters into a uniform electric field and acquires a uniform acceleration of 10^4 m s^{-2} in the direction of its initial motion.
(i) Calculate the time in which the electron would acquire a velocity double of its initial velocity.
(ii) How much distance the electron would cover in this time?

49. Obtain a relation for the distance travelled by an object moving with a uniform acceleration in the interval between 4^{th} and 5^{th} seconds.

50. Two stones are thrown vertically upwards simultaneously with their initial velocities u_1 and u_2 respectively. Prove that the heights reached by them would be in the ratio of $u_1^2 : u_2^2$. (Assume upward acceleration is –g and downward acceleration to be +g).

BIOLOGY

Answer the following questions:

a. Who coined the term cell? State cell theory.
b. How does Golgi apparatus help Endoplasmic Reticulum?
c. Name the plastid involved in the conversion of green tomato to red?
d. State one feature that is similar and one feature that is dis-similar with respect to mitochondria and plastids.
e. Which cell organelle would you associate with elimination of old and worn-out cells? Why?
f. Why are organisms such as bacteria called prokaryotes?
g.
   - Why chloroplasts are commonly called 'kitchen of the cell'?
   - Why lysosomes are commonly termed 'suicidal bags'?
   - Why mitochondria are said to be the 'powerhouse of the cell'?

h) Write the name of different plant parts in which chromoplast, chloroplast and leucoplast are present.

i) Give one word for the following:
   - (a)Transporting channels of the cell
   - (b)Powerhouse of the cell
   - (c)Packaging and dispatching unit of the cell
   - (d)Digestive bag/scavengers of the cell
   - (e)Storage sacs of the cell
   - (f)Kitchen of the cell
   - (g)Control room of the cell

- (h)Protein factory of the cell
- (i)Energy currency of the cell

j) What are chromosomes? List their two functions.

k) One day Seema saw her mother making pickle. Her mother cut the carrots, turnips and cauliflowers into small pieces, washed them and put them in the sun for few hours. Thereafter, she mixed common salt, oil, paste of onion, ginger and garlic, jaggery, acetic acid, etc. as per requirement with the cut vegetables and heated them. After cooling, she put the contents in air tight jar and kept it in the sun for many days.

- Why did Seema's mother cut the vegetables into small pieces and put them in the sun for few hours?
- Why did she mix common salt in the cut vegetables and heat it? Name the process involved.
- Why did she mix acetic acid?

l) Seema wanted to eat rice and kidney beans (Rajma). She asked her mother to cook the same for lunch tomorrow. At night, her mother took a cup of kidney beans and put them in container having some water. She kept the container covered overnight. Next morning, she cooked rice and kidney beans for lunch. Seema asked her mother the following questions:

- Why did you soak kidney beans in water overnight?
- Name the scientific phenomenon involved in above process.
- Name at least one more food item that is cooked in this way.

m) I usually go for late evening walk with my mother who is biology teacher. While walking, I saw many plants having coloured flowers . I also saw few plants having white flowers and I also smelled aroma being emitted by them. I was curious and asked my mother the following questions:

- Why do plants have various coloured flowers?
- Why do certain flowers emit aroma?

Prepare an investigatory project on the topic “Viral diseases”, emphasising the following points:

a) Introduction to Virus
b) Viral Infections
c) Viral Diseases
d) Clinical Characteristics
e) Treatment

Instructions:

The project report should be handwritten on A4 Size pages and should contain 20-25 pages.

The report should be presented in the following order: a) Cover page including Title of project, student information, name of the school and academic session b) Acknowledgements c) Chapters with relevant headings d) Summary and conclusion e) Bibliography.

All photographs and sketches should be labelled and acknowledged.

Credits will be awarded to original drawings and illustrations.

CHEMISTRY

1. Fill in the blanks:-

a. Matter is made up of small_____.

b. The forces of attraction between the particles are _____ in solids, _____ in liquids and _____ in gases.

c. _____ is the change of gaseous state directly to solid state without going through liquid state, and vice-versa.

d. Evaporation causes _____.

e. Latent heat of fusion is the amount of heat energy required to change 1 kg of solid into liquid at its _____.

f. Solid, liquid and gas are called the three _____ of matter.

g. The smell of perfume gradually spreads across a room due to _____.

h. Rapid evaporation depends on the _____ area exposed to atmosphere.

i. As the temperature of a system increases, the pressure of the gases _____.

j. As the volume of a specific amount of gas decreases, it's pressure _____.

k. As the temperature of a gas decreases, I's volume _____

l. Gas molecules at higher temperatures have more _____ than at cooler temperatures.

m. Usually the total charge of a plasma is _____.

n. The pressure inside of a sealed tube if you raise the temperature go _____

o. Forces of attraction in liquids are _____ than in solids.

p. Liquids that move quickly downhill are described as having _____

2. True/ False:-

a. Boiling is a bulk phenomenon.

b. Evaporation is a surface phenomenon.

c. The rate of evaporation depends only on the surface area exposed to the atmosphere.

d. Latent heat of vaporization is the heat energy required to change 1 kg. of a liquid to gas at atmospheric pressure at its melting point.

e. Water at room temperature is a liquid.

f. Atoms in a liquid are further apart than the atoms in a gas.

g. The molecules in a gas are in constant motion.

h. Gases present in air have the same pressure throughout the entire atmosphere.

i. All materials move from solid to liquid to gas as the temperature increases.

j. Because electrons have been stripped away from atoms in plasma, plasmas have a negative charge.

k. It is just as easy to compress a liquid, as it is to compress a gas.

l. Evaporation and boiling are the same processes because molecules move from a liquid to gaseous state.

m. If we pour liquid nitrogen (N2) into a glass, it will change its state to a solid.

n. You may find plasma in a star.

o. A system that changes from a solid state to a liquid state gains energy.

p. Plasmas are all made of the same ions. They have different colours due to different amounts of electricity.

3. What is condensation? How is the condensation of a gas carried out?

4. Why do solids not diffuse?

5. Convert the following Kelvin temperature to degrees Celsius.

a. 175 K
b. 295 K
c. 300 K
d. 225

6. Convert the following Celsius temperature to Kelvin temperature.

a. 25 ^{0}C
b. -15 ^{0}C
c. 0 ^{0}C
d. 3 ^{0}C

7. Arrange the following substances in increasing order of intermolecular force of attraction: water, sugar, oxygen

8. What is the physical state of water at the following temperatures?

(a) 25 ^{0}C
(b) 0 ^{0}C
(c) 100 ^{0}C

9. Why does the temperature of a substance remain constant during melting and boiling even when heat is being supplied to it continuously?

10. Explain the diffusion of copper sulphate into water.

11. M.C.Q type questions-

a. The quantity of matter present in an object is called its:
a) Weight
b) Gram

c) Mass
d) Density

b. The boiling point of alcohol is 78*C. What is this temperature in Kelvin scale:
a) 373 K
b) 351 K
c) 375 K
d) 78 K

c. In which phenomena water changes into water vapour below its B.P.?
a) Evaporation
b) Condensation
c) Boiling
d) No such phenomena exist

d. The boiling point of water on Celsius and Kelvin scale respectively is:
a) 373, 273
b) 0, 273
c) 273, 373
d) 100, 373

e. When we put some crystals of potassium permanganate in a beaker containing water, we observe that after sometime whole water has turned pink. This is due to:
a) Boiling
b) Melting of potassium permanganate crystals
c) Sublimation of crystals
d) Diffusion

f. The force that binds the particles of matter together is known as:
a) Intermolecular space
b) Bond
c) Intermolecular force
d) Nuclear force

g. The change of a liquid into vapour is called:
a) Vapourization
b) Solidification
c) Sublimation
d) None of these

h. Which of the following describes the liquid phase?
a) It has a definite shape and a definite volume
b) It has a definite shape but not a definite volume
c) It has a definite volume but not a definite shape
d) It has neither a definite shape nor a definite volume

i. When a teaspoon of solid sugar is dissolved in a glass of liquid water, what phase or phases are present after mixing:
a) Liquid only

b) Still solid and liquid
c) Solid only
d) None of these

j. Which of the following statements best explains why a closed balloon filled with helium gas rises in air?
a) Helium is a monatomic gas, whereas nearly all the molecules that make up air, such as nitrogen and oxygen, are diatomic.
b) The average speed of helium atoms is higher than the average speeds of air molecules, and the higher speed of collisions with the balloon walls propels the balloon upward.
c) Because the helium atoms are of lower mass than the average is molecules, the helium gas is less dense than air. The balloon thus weighs less than the air displaces by its volume.
d) Because helium has a lower molar mass than the average air molecules, the helium atoms are in faster motion. This means that the temperature. Hot gases tend to rise.

k. What is the term used to describe the phase change of a liquid to a gas?
a) Boiling
b) Condensation
c) Melting
d) None of the above

l. What term is used to describe the phase change of a solid to a liquid?
a) Freezing
b) Melting
c) Boiling
d) None of the above

m. What is the term used to describe the phase change as a liquid becomes a solid?
a) Evaporation
b) Condensation
c) Freezing
d) None of the above

n. Which has the least energetic molecules?
a) Solids
b) Liquids
c) Gases
d) Plasmas

o. Which of these choices will not change the state of matter?
a) Temperature
b) Crushing a crystal
c) Pressure
d) Heat

p. If you leave water in a glass and some molecules turn into a gas, it is called:
a) Condensation
b) Evaporation
c) Extinction
d) Solidification

q. As of the 1990s, scientists have proved the existence of how many states of matter?
a) Two
b) Three
c) Four
d) Five

r. Out of the following which is the densest state of matter?
a) Solids
b) Liquids
c) Gases
d) Plasmas

12. Explain why?

i. A gas fill a vessel completely.
ii. Camphor disappears without leaving any residue.
iii. The temperature does not rise during the process of melting and boiling, through heat energy is constantly supplied.
iv. Water stored in an earthen vessel becomes cool.
v. An iron almirah is a solid at room temperature.

13. Which phenomenon occurs during the following changes?

ii. Wax melts in the sun.
iii. Drying of wet clothes
iv. Formation of clouds
v. Density of liquids is more than gases.

14. Define:

i. Melting point
ii. Boiling point
iii. Vaporization
iv. Freezing
v. Brownian motion

15. Project work-

Study the rate of evaporation of different substances like water, Dettol, mouthwash, Any aerated drinks, perfume, any edible oil, acetone(nail polish remover), vinegar, naphthalene balls and camphor. Record your observations on A4 sheets for a sample of 10ml (liquid) or a quantity (solid) which would fill in a small match box.

S.NO.	Name of substance	State of matter	Quantity of substance taken	Time taken to evaporate in min.	Uses