CBSE Sample Paper - 01
SUMMATIVE ASSESSMENT –II
Class – IX SCIENCE

Time allowed: 3 hours Maximum Marks: 90

General Instructions:

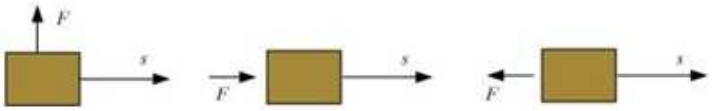
a) All questions are compulsory.
b) The question paper comprises of two sections, A and B. You are to attempt both the sections.
c) Questions 1 to 3 in section A are one mark questions. These are to be answered in one word or in one sentence.
d) Questions 4 to 6 in section A are two marks questions. These are to be answered in about 30 words each.
e) Questions 7 to 18 in section A are three marks questions. These are to be answered in about 50 words each.
f) Questions 19 to 24 in section A are five marks questions. These are to be answered in about 70 words each.
g) Questions 25 to 33 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.
h) Questions 34 to 36 in section B are based on practical skills. Each question is a two marks question.

Section A

1. Name the Indian philosopher who proposed the theory of matter.
2. What is Dalton?
3. Define 1 watt of power.
4. Will advanced organisms be the same as complex organisms? Why?
5. Why are sound waves called mechanical waves?
6. List any three human activities which would lead to an increase in the carbon dioxide content of air.
7. What happens when sound travels in air?
8. Differentiate between Potential and kinetic energy?
9. How can ultrasound be used to detect the defect in metal block?
10. Write the postulates of Bohr theory?
11. Write the distribution of electrons in carbon and sodium atoms.
12. Write characteristics of angiosperms.
13. What precautions can you take in your school to reduce the incidence of infectious diseases?
14. The kinetic energy of an object of mass, m moving with a velocity of 5 ms^{-1} is 25 J. What will be its kinetic energy when its velocity is doubled? What will be its kinetic energy when its velocity is increased three times?

15. What is a sound board? Explain the working of a soundboard with the help of a labelled diagram.

16. In each of the following a force, *F* is acting on an object of mass, *m*. The direction of displacement is from west to east shown by the longer arrow. Observe the diagrams carefully and state whether the work done by the force is negative, positive or zero.



17. The number of dengue cases had increased in Pooja's village in last one year. She has studied that diseases like dengue spread through mosquitoes which breed in stagnant water. She immediately suggested her friends and decided to kill the mosquitoes in water bodies in the locality. They also took help of nearest municipal office.

Answer the following questions based on above information:

(i) Which preventive measures do you suggest for the prevention of such diseases caused by mosquitoes? Mention any two measures.

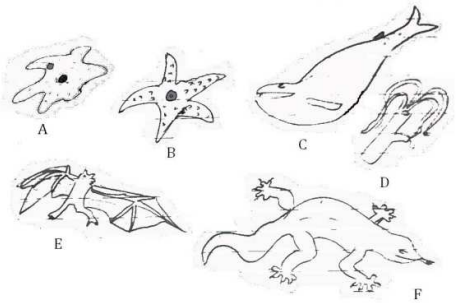
(ii) Which values are displayed by Pooja in taking initiative?

(iii) Suggest one school activity to promote such values in school students.

18. We know that many human activities lead to increasing levels of pollution of the air, water-bodies and soil. Do you think that isolating these activities to specific and limited areas would help in reducing pollution?

19. The body of a patient has lost its power of fighting against infections. Which disease may the patient be suffering from? Name the pathogen and describe any two modes of its transmission from the patient to other person.

20. Observe the figures given below and answer the following questions.



(a) which of the following animals are invertebrates underline them

(b) name the underlined animals

(c) give two important characteristics of underlined animals.

21. Briefly describing the gravitational potential energy, deduce an expression for the gravitational potential energy of a body of mass *m* placed at a height *h,* above the ground.

22. What are the failures of Dalton Atomic theory?

23. Explain how the human ear works.

24. 'Water is essential for the sustenance of life' Justify the statement.

Section B

25. Molecular mass of water (H_2O) is

(a) 18g (b) (b) 8g

(c) 33g (d) 34g

26. Rutherford's alpha-particle scattering experiment was responsible for the discovery of

(a) Atomic Nucleus (b) Electron

(c) Proton (d) Neutron

27. The lowest category of classification is:

(a) phylum (b) genus

(c) species (d) family

28. Which one of the following is not important for individual health?

(a) Living in clean space (b) Good economic condition

(c) Social equality and harmony (d) Living in a large and well furnished house

29. If the body starts from rest, then change in its kinetic energy is

(a) positive (b) Negative

(c) Zero (d) May be Positive or negative depending upon the mass of the body

30. The charge of proton (p^+) is:

(a) $+1.6\times10^{-19}C$ (b) $-1.6\times10^{-19}C$

(c) $+1.6\times10^{19}C$ (d) $-1.6\times10^{19}C$

31. Atomic radius is measured in nanometers and

(a) 1nm = $10^{-10}m$ (b) 1m = $10^{-10}nm$

(c) 1m = $10^{-9}nm$ (d) 1nm = $10^{-9}m$

32. Molecular formula for calcium fluoride is

(a) CaF_2 (b) CaF

(c) Ca_2F (d) 2CaF

33. Presence of diaphragm is the characteristic feature of:

(a) amphibian (b) reptile

(c) mammals (d) Pisces

34. A doctor/nurse/health-worker is exposed to more sick people than others in the community. Find out how she/he avoids getting sick herself/himself.

35. A mass of 10 kg is at a point A on a table. It is moved to a point B. If the line joining A and B is horizontal, what is the work done on the object by the gravitational force? Explain your answer.

36. Suppose you and your friend are on the moon. Will you be able to hear any sound produced by your friend?

CBSE Sample Paper -01
SUMMATIVE ASSESSMENT –II
SCIENCE (Theory)
Class – IX

Solution

1. Kanad proposed the theory of matter around 600 BC.
2. One atomic mass unit or unified mass (u) = 1.66 x10^{-27}kg and One unified mass is called Dalton.
3. 1 watt is the power of an agent which does work at the rate of 1 joule per second.
4. Yes we can say that the advanced organisms are the same as complex organisms because advancement has occurred due to the process of evolution where a group of simple organisms have changed themselves into the complex forms of life for better survival.
5. Since sound waves need a medium for their propagation therefore we can say that sound waves are mechanical waves.
6. Three human activities which would lead to an increase in the carbon dioxide content of air are:
   (a) burning of coal and petroleum
   (b) combustion of wood
   (c) deforestation (cutting down forests)
7. When sound wave travels through air then the pressure and density of air changes. As the disturbance propagates through a medium, then alternate regions of pressure variations are created. The region where particle come closer to each other (high density) and pressure of air is high is called as compression. The region where particles far apart from each other (low density) and pressure of air is less is called as rarefaction compression and rarefactions always occur together.
8.

Potential energy	**Kinetic energy**
It is the energy possessed by the body on the virtue of its position.	It is the energy possessed by the body on the virtue of its motion.
Potential energy = Mgh M= Mass g = Acceleration due to gravity	Kinetic energy = $\frac{1}{2}mv^2$ M = Mass

h = Height	V = velocity
eg of potential energy water stored in a upper head tank	eg:- a moving car

9. Ultrasound are those waves which have frequency greater than 20 KHZ. Now, metal blocks are subjected to ultrasound at one end and at the other end, detectors are placed. If the metal block does not contain any defect then ultrasound travel through and are detected by detectors. If the metal block has any defect, than from that region ultrasounds are not detected and gets reflected back indicating the presence of defect in the block.

10. The postulates of Bohr's theory are:

(a) Electron move around the nucleus in definite circular path called orbits.

(b) Each orbit is associated with a fixed amount of energy.

(c) The larger the radius of the orbit, the greater is the energy of the electrons in them.

(d) Electrons can move from one orbit to another by gaining or losing a fixed amount of energy.

11. (a) Electronic distribution in carbon atom

Atoms number of carbon = 6

Number of electrons = 6

Distribution of electrons: K = 2, L = 4

(b) Distribution of electrons in sodium atoms

Atoms number of sodium atoms = 11

Number of electrons in sodium atoms = 11

Distribution of electrons in sodium atom: K = 2, L = 8, M = 1

12. Characteristics of angiosperms:

(a) The angiosperms are the dominant group of land plants. These are the most common flowering plants.

(b) The angiosperms are seed bearing plants and the seeds are enclosed inside the fruit formed from ovary.

(c) Carpel is like of *megasporophyll* as gymnosperms, but it is differentiated ovary, style and stigma.

(d) The pollen grain is received by the stigma causing pollination.

(e) Ovary develops into fruit and ovules into seeds after the act of fertilization.

13. To reduce the incidence of infectious diseases in my school the precautions will include:

(i) Isolating diseased students and clean surroundings

(ii) clean food and purified drinking water

(iii) not eating junk food and open/uncovered food materials

14. K.E. of the object $= \frac{1}{2} \times m \times 5^2$

$25 = \frac{1}{2} \times m \times 25$

$m = \frac{(25 \times 2)}{25} = 2$ kg

If velocity is doubled

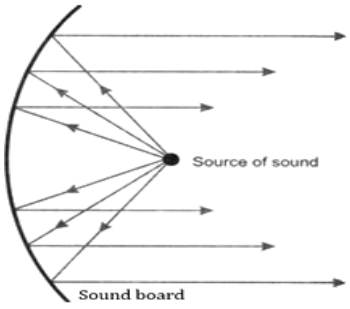
K.E. $= \frac{1}{2} \times 2 \times 10^2$

$= \frac{200}{2} = 100$ J i.e. K.E. will become four times

If velocity is increased three times

K.E. $= \frac{1}{2} \times 2 \times 15^2 = 225$ J i.e., K.E. will become nine times

15. The reflection of sound may take place at curved surfaces also. This fact is made use of in the large halls to spread sound evenly throughout the hall. This is done by using sound boards. The speaker is located at the focus of the sound board (Fig.) and the concave reflecting sound boards are placed behind the speakers in a large hall. The sound board prevents the spreading out of the sound waves in various directions. It sends the sound waves from the speaker at its focus, by reflection towards the audience. This helps in making the speech readily



16. (i) Since in this diagram displacement is perpendicular to the direction of force, so work done is zero.

(ii) Since in this diagram displacement is in the direction of force, so work done is positive.

(iii) Since in this diagram displacement is in the opposite direction of the force applied hence work done is negative.

17. (a) Avoid water logging, proper and regular disinfection, use of mosquito net and repellents.

(b) Community Service/Social Responsibility/Environmental protection/ Awareness about healthy living conditions. (Any two)

(c) Organising campaigns for creating awareness amongst masses/ Organising debates/Arranging similar community service/Group discussion. (Any one)

18. Isolating many human activities lead to increasing levels of pollution of the air, water-bodies and soil would help in reducing water and soil pollution but it can hardly make any difference to air pollution severity the reason is gases will spread from isolated places and reach everywhere. Instead of isolating we must stress on sustainable management of our resources and cut down or replace their use like using cleaner fuels like CNG in place of fossil fuels.

19. The body of a patient

It is caused by HIV (Human Immuno deficiency Virus) Modes of transmission are

(1) By sexual contact with infected person.

(2) By the use infected syringe.

20. (a) A, B, D

(b) A – Amoeba, B – Starfish (asterias) D – Hydra.

(c) (i)Amoeba-

1. It is uninucleate
2. locomotion is by finger like pseudopodia

(ii) Asterias (starfish)-

1. Body is radially symmetrical
2. Body cavity is modified into a water – vascular system with elastic tube – like outword extension for locomotion called tube – feet or podia.

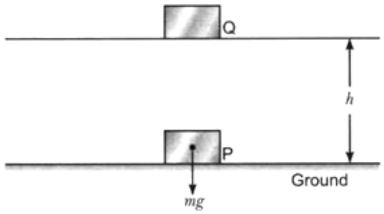
(iii) Hydra-

1. Mouth is surrounded by tentacles which helps in feeding
2. Respiratory, circulatory and excretory organs are absent.

21. When an object is raised through a certain height above the ground, its energy increases. This is because the work is done on it, against gravity. The energy present in such an object is called gravitational potential energy. Thus, the gravitational potential energy of an object at a

point above the ground is defined as the work done in raising it from the ground to that point against gravity.

Consider a body of mass 'm' lying at point 'P' on the Earth's surface, where its potential energy is taken as zero.



Measurement of potential energy

As weight, mg acts vertically downwards, so to lift the body to another position Q at a height h, we have to apply a minimum force which is equal to mg in the upward direction. Thus, work is done on the body against the force of gravity.

We know that,

Work done, W=Fs ... (i)

As, F = mg and s = h

Putting these values in equation (i), we get

W = $mg \times h$ =mgh

This work done on the body is equal to the gain in energy of the body. This is the potential energy of the body.

Therefore, Potential energy PE = mgh

22. Failures of Dalton Atomic Theory are:

(a) Atom is not the smallest particle as it is made up of protons, neutrons and electrons.

(b) Atom's mass can be cornered to energy ($E = mc^2$) and hence can be created and destroyed.

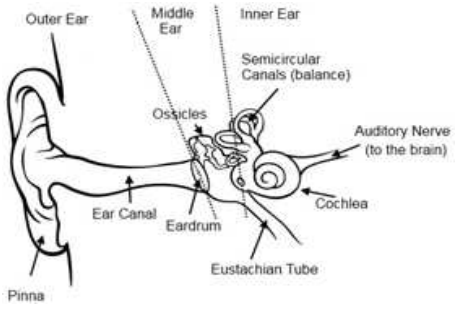
(c) Atoms of one element have been charged into atoms of another element through artificial transmutation of elements.

(d) Atoms of same element need not resemble each other in all respects as isotopes (Different of same element) exist.

(e) Atoms of different elements need not differ in all respects as isobars (same forms of different elements) exist.

23. The sound waves from our surroundings are collected by the 'pinna'. These sound waves pass through the auditory canal and fall on the eardrum. Sound waves propagate through compressions and rarefactions. When compression of sound waves reaches the eardrum, the pressure on the outside of membrane increases and pushes the eardrum inward. Similarly, when a rarefaction falls on the eardrum, the pressure on the outside of the membrane decreases and it moves outward. In this way, the eardrum begins to

vibrate. J The vibrations of eardrum causes the vibrations in the small bone, called hammer. From hammer these vibrations are passed to second bone anvil and f finally to third bone stirrup. The vibrating stirrup strikes on the membrane of the oval window and passes its vibrations to the liquid in the cochlea. The; vibrating liquid of cochlea converts the pressure variations of sound waves into electrical signals. These electrical signals are sent to the brain via the auditory nerve. The brain interprets these electrical signals as sound and we get the sensation of hearing.



Human beings hear only sounds with frequencies from about 20 Hz to 20,000 Hz. These are the limits of audibility; the upper limit decreases with age. A hearing aid can be used to send an amplified sound to the eardrum when. someone can hear only quite loud sounds. If the eardrum of the middle ear is damaged, an aid can pass on vibrations to the cochlea directly through the skull bones. Deafness occurs if the cochlea or auditory nerve is damaged.

24. Importance of water for life:

(a) It acts as a universal solvent.

(b) Most of the activities occur in water inside the body.

(c) Substances are transported from one part of the body to the other in a dissolved form.

(d) It dissolves waste products and help in excretion.

(e) Aquatic organisms utilize oxygen dissolved in water.

25. (a)
26. (c)
27. (c)
28. (a)
29. (a)
30. (a)
31. (c)
32. (a)
33. (c)

34. A doctor/nurse/health-worker is exposed to more sick people than others in the community still they avoid getting sick themselves because they take care of the preventive measures like personal and community hygiene/cleanliness and immunisation to prevent infectious diseases.

35. Since work done on the object by gravitational force depends upon change in the vertical height of the object. Vertical height of the object is not changing as the joining A and B is horizontal at the same height hence the work done is zero.

36. There is no air on moon hence there is no medium for sound propagation on moon. As a result me and my friend will not be able to hear any sound produced by my friend.