CBSE Sample Paper -04
SUMMATIVE ASSESSMENT –II
Class – IX SCIENCE (Theory)

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 7 in section A are two marks questions. These are to be answered in about 30 words each.
e) Questions 8 to 19 in section A are three marks questions. These are to be answered in about 50 words each.
f) Questions 20 to 24 in section A are five marks questions. These are to be answered in about 70 words each.
g) Questions 25 to 42 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

Section A

1. What is reverberation?
2. Define law of constant proportion.
3. Define pseudocoel.
4. Define energy. Name and define its S.I unit.
5. If one mole of carbon atoms weighs 12 g, what is the mass of 1 atom of carbon?
6. Give four main features of phylum coelenterate.
7. A sound wave has a frequency of 2kHz and wavelength of 45cm,it takes 4 second to travel. Calculate the distance it travels?
8. If any explosion takes place at the bottom of the lake, what type of shock waves in the water will be produced?
9. a. Define Kinetic energy.

   b. A stone of mass 2 Kg is falling from rest from the top of steep hill. What will be its kinetic energy after 5 sec? ($g=100ms^{-2}$)
10. Anju enjoys ridingfastly on a swing so Manju stands behind the swing every timeAnju rides on it and pushes her. However Manju also gets scared of Anju riding too fast and keeps yelling out to her to be careful. However, Anju refuses from being slow.

(a) Compare the qualities of Anju and Manju.

(b) What energy conversion takes place on a swing?

(c) Muscular energy of Manju converts to which energy on pushing the swing?

11. (a) A household consume 1 kWh of energy per day. How much energy is this in joules?

    (b) A person carrying 10 bricks, each of mass 2.5 Kg on his head moves to a height of 20Meter in 50 Seconds. Calculate the power spent in carrying bricks by the person? ($g=10\ m/s^2$)

12. A body of mass 5Kg is thrown vertically upwards with a speed of 10m/s, what is its kinetic energy when it is thrown? Find its potential energy when it reaches at the highest point. Also find the maximum height attained by the body. ($g=10\ m/s^2$)

13. Calculate the number of atoms in 120g of calcium and 120g of iron. Which one has more number of atoms and how much is the difference?

    (Given Atomic mass of calcium =40 u, Iron=56 u)

14. (a) What was Thomson's model of an atom?

    (b) Write any two observations of Rutherford's model of atom.

15. Give three examples of range of variations that you see in life-forms around you.

16. Name the groups of organisms which commonly cause infected diseases.

17. What are the major sites of infection for tuberculosis?

18. How are diseases spread through water?

19. (a) Which property of sound leads to the formation of echoes. Explain briefly?

    (b) Why are ceilings of concert halls and conference halls made curve?

    (c) Can two astronauts talk on the surface of the moon as they do on the surface of the earth? Why?

20. Why is AIDS considered to be a syndrome and not a disease?

21. Establish the relationship between speed of sound, its wavelength and frequency. If velocity of sound in Air is 340 m/sec. Calculate the

    (a) Wavelength when frequency is 256Hz.

    (b) Frequency when wavelength is 0.85Meter.

22. a. Define kinetic energy of an object. Can kinetic energy of an object be negative? Give reason.

    b. A car weighing 1200 kg is uniformly accelerated from rest and covers a distance of 40 m in 5 sec. calculate the work, the car engine had to do during this time.

23. OTBA

24. OTBA

Section B

25. Silver nitrate solution was mixed with 5g of sodium chloride solutions to verify law of conservation of mass.8.1 gram of silver chloride was formed and sodium nitrate formed was equal to half of the amount of silver nitrate solution used. What is the amount of $AgNO_3$ used and $NaNO_3$ formed.
26. Write the difference between male and female cone of Pinus?
27. The length , breadth and height of a cuboidal mass m kg are 5cm, 3 cm and 2 cm respectively. Calculate the surface area where the pressure on the floor will be more.
28. In the experiment for verification of Law of conservation of mass with barium chloride and sodium sulphate the white precipitate is of:
    (a) Barium Sulphate (b) Barium chloride (c) Sodium Chloride (d) Sodium Sulfate
29. In a chemical reaction, the sum of masses of the reactants and the products remain unchanged.This is called:
    (a) Law of constant Proportions
    (b) Law of Multiple Proportions
    (c) Law of Conservation of Mass.
    (d) Dalton's Principle
30. Life span of a male mosquito is normally
    (a) 1 Month
    (b) 1 day
    (c) 2Months
    (d) 1 Week
31. Before becoming a pupa, a larva sheds skin:
    (a) 3 times
    (b) 4 times
    (c) 1 times
    (d) 2 times
32. The earthworm belongs to group :
    (a) Arthropods
    (b) Echinodermata
    (c) Annelida
    (d) Platyhelminthes

33. Needle shaped structure in pinus plant is
    (a) Leaf
    (b) Shoot
    (c) Stem
    (d) Reproductive Part
34. Echo can be heard clearly, if the minimum distance between the source of sound and reflecting surfaces
    (a) 10 Meter
    (b) 12 Meter
    (c) 15.2 Meter
    (d) 17.2 Meter
35. If the air in the room warms up, the speed of sound
    (a) Increases
    (b) Remains Same
    (c) Decreases
    (d) Fluctuates
36. Which of the following has the highest density?
    (a) Alcohol
    (b) Glycerin
    (c) Water
    (d) Sea Water

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Solution

1. It is defined as persistence of sound due to its multiple reflections.
2. A compound prepared by any method contains the same elements in the fixed ratio by mass is the law of constant proportion.
3. A false body cavity between body wall and gut, e.g. in roundworms.
4. Energy is defined as capacity of an object to do work. SI unit of energy is joule. Energy possessed by a body is said to be 1 joule if it can displace an object by 1 m by applying a force of 1N in the direction of force.
5. 1 mole of C= 12 g

   1 mole of C=6.022×10^{23} Atoms

   6.022×10^{23} atoms of C=12 g

   1 Atom of C= $12/6.022 \times 10^{23} = 1.99 \times 10^{-23}$g
6. Four main feature of phylum coelenterate are:
   (a) These animals live in water.
   (b) The body has a sac like body cavity with a single opening to the outside for ingestion and egestion.
   (c) These are the first multicellular animals which possess tissue level organization with distinct division of labour.
   (d) The body is made of two layers of cells – one makes up cells on the outside of the body and the other makes up inner lining of body.
7. V=330ms^{-1} , t=6 s

   D=vt/2 = (330 x6)/2 = 990m
8. Longitudinal waves will be produced.
9. a. Energy due to the motion of a body is called kinetic energy.

      K.E. = ½ mv^2

   b. m=2Kg, t=5 s

      Velocity after 5 s(v)=0+ 10x5=50 m/s

      Therefore K.E.=1/2 x 2 x $(50)^2$ =2500 joule=2.5 KJ.

10. (a) Anju is brave but careless to some extent. Manju however is caring, co-operating and helpful.

    (b) Potential (at extremes) to kinetic (at mean position) and vice versa.

    (c) Kinetic Energy of swing.

11. (a) 1 kWh=3.6 x 10^6 joule

    (b) M=2.5Kg, g=10m/s^2 , h=20m , n=10

    Power(P)=nmgh/t = (10x2.5x10x20)/50

    100 watt.

12. m=5 Kg

    v= 10m/s

    Kinetic energy = ½ mv^2

    = ½ x 5 x $(10)^2$

    = 250 J

    At the highest point , v=0, so kinetic energy =0

    Loss in kinetic energy =gain in kinetic energy.

    Therefore Potential energy=250 J

    Height, h= Potential Energy/mg= (250)/(5x10) (g=10m/s)

    Answer=5m

13. 1 mole of Ca=40g

    No. of atoms of Calcium= no. of moles x 6.022x10^{23}

    = (Given Mass/Molar Mass)x 6.022x10^{23}

    = (120/40)x 6.022 x10^{23}

    = 1.8066 x 10^{24} atoms

    = 1.81 x 10^{24} atoms

    No. of atoms of Iron = (Given Mass/Molar Mass)x6.022x10^{23}

    = (120/56) x 6.022 x10^{23}

    = 1.29 x 10^{24} atoms.

    Calcium has more number of atoms .

    Difference in number of atoms

    = 1.81 x 10^{24} - 1.29 x 10^{24}

    = 10^{24} (1.81-1.29)

    = 0.52 x 10^{24}

= 5.2 x 10^{23} atoms.

14. (a) Thomson's model of an atom
    (i) Atom consists of positively charge uniformly distributed.
    (ii) Electrons are embedded in positively charged sphere like seeds in watermelon.
    (iii) Atom is neutral.
    (iv) Mass of an atom is uniformly distributed.
    (b) (i) Most of α-rays passed through gold foil undeviated.
    (ii) someα- rays deviated through larger angles.
15. The range of variations that we see in life-forms around us are:
    (a) Size: There is a lot of variation in the size of organism that we see. The size of microscopic bacteria is few micrometers while the size of blue whale is about 30 meters and height of red wood tree s of California is about 100 meters.
    (b) Life Span: There is lot of variation in the life span of organisms. The life span of insects like mosquito is only a few days whereas, the life span of a pine tree is thousand of years.
    (c) Colour: There is a lot of variations seen in colour. Worms are colorless or transparent whereas flowers and birds are brightly coloured.
16. Groups of causing organism are:
    (a) Viruses (b) Bacteria (c) Fungi (d) Protozoan's (e) Multicellular Worms
17. There are two specific sites for infections as follows:
    (a) Lung or Pulmonary T.B. : The person suffers with persistent cough and produces blood stained sputum. There is loss of weight, weakness, chest pain and breathlessness.
    (b) Lymph gland T.B. : It leads to swelling and tenderness of lymph glands often in leg which may discharge secretion through skin.
18. Diseases spread through water when the excreta from someone suffering from an infectious disease such as cholera , gets mixed with drinking water used by people living nearby. The Cholera causing microbes will enter new hosts through the water they drink and cause disease in them. Such diseases are more likely to spread in the absence of safe supply of drinking water.
19. **a.** The property of sound to get reflected from a surface of solid or liquid, and to persist on our brain for a very short time leads to formation of echoes.

b. Reflection of sound from parabolic concave back walls spread the sound uniformly throughout the room, even to the last corner. So, the audiences at back portion also listen clearly.

c. No, as there is no atmosphere in the moon, sound can't travel on the surface of the moon.

20. AIDS is considered a syndrome and not a disease because AIDS causing virus- HIV comes into the body via the sexual organ or any other means like blood transfusion and spread to lymph nodes all over the body. The virus damages the immune system of the body and the body can no longer fight off even minor infections. Instead, every small cold can become pneumonia, or minor gut infection can become severe diarrhea. The effect of disease becomes very severe and complex, at times killing the person from AIDS. Hence there is no specific disease symptoms for AIDS but it results in a complex diseases and symptoms.

21. We know that speed of wave, v= Length Travelled/ Time taken

    => $v=\lambda/T=\lambda f$ as $f=1/T$

    $V= 340\ ms^{-1}$

    (a) $\lambda=v/f= 340/256=1.33m$

    (b) $f=v/\lambda=340/0.85=400$ Hz

22. (a) Energy by virtue of motion of body is called its kinetic energy. Consider a mass m moving with a speed u and a force F applied on it, which changes its velocity to displacing by s.

    Work done,

    $W=ma.((v^2-u^2)/2a)$ (W=F.s)

    So, $W=1/2\ m\ (v^2-u^2)$

    If initial velocity, u is zero, then $w=1/2\ mv^2$

    K. E. can't be negative as it has all positive quantities. It is scalar quantity, so no direction is taken in to consideration.

    (b) m=1200 Kg, s=40 m and t=5 s

    Using $s=ut + ½\ at^2$ and u=0;

    We get $a= 2s/t^2 = (2x40)/ (5)^2 = 80/25\ m/s^2$

    Work done, = F.s= ma x s= 1200 x 80/25 x 40

    = 153600 joule=153.6 KJ

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25. Let mass of AgNO3 used be x.

Mass of NaNO3 formed will be x/2

Mass of reactants= mass of products

x+ 5 = 8.1 + x/2

x/2 = 3.1

x = 6.10g

mass of $AgNO_3$used = 6.10 g

mass of $NaNO_3$used = 6.10/2 = 3.05 g

26. Female cones are:

    Large and woody

    Male cones are:

    Smaller and tender

27. (3 x 2) cm^2Pressure is inversely area. If area is less, pressure is more.
28. a
29. c
30. d
31. b
32. c
33. a
34. d
35. a
36. b