CBSE Sample Paper -02 (solved)
SUMMATIVE ASSESSMENT –II
SCIENCE (Theory)
Class – IX

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

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Section A

1. Write the formula of lead phosphate.
2. What is meant by an acute disease?
3. State the principle for floatation for an object of weight W immersed in a fluid.
4. Calculate the number of moles in 34 g of NH^3.(given atomic mass of N = 14 u; H = 1 u)
5. a. How do bacteria protect themselves?
   b. how is rabies virus spread?
6. Why are railway tracks laid on large sized concrete sleepers? Explain.
7. What are polyatomic ions? Give two examples of each of polyatomic cations and anions.
8. State the observations in a α-particle scattering experiment which led Rutherford to make the following conclusions:

a. Most of the space in an atom is empty.

b. Whole mass of an atom is concentrated in its centre.

c. Centre is positively charged.

9. State the conditions responsible for the spread of malaria and measures to prevent and control it.
10. There was a boy called Vinay. Vinay was very close to his grandfather. His grandfather is suffering from oral cancer for last six months. Both Vinay and his grandfather use to play various games together before the disease. They enjoy each others company very much. Vinay wants his grandfather to live longer and discusses his concern on the helpline with an NGO.

    a. What value is shown by Vinay?

    b. What can Vinay do to help his grandfather?
11. Differentiate between taxonomy and systematics.
12. Explain why antibiotic do not work against viruses but work against many group of bacteria.
13. What is upthrust? What are the quantities that can vary upthrust? How does it account for the floating of a body? When a partially immersed body is pressed down a little, what will happen to the upthrust?
14. State the Archimedes' principle. How will you verify it experimentally?
15. A force applied on a body of mass 4 kg for 5 seconds changes its velocity from 10 m/s to 20 m/s. Find the power required.
16. Define the term tone. A person is listening to a sound of 500 Hz sitting at a distance of 450 m from the source of the sound. What is the time interval between successive compressions reaching his ears from the source.
17. A force of 10 N acts on a body of 2 kg for 3 seconds. Find the kinetic energy acquired by the body in 3 seconds.
18. Two bulbs of 40W each are lighted for eight hours daily. Find the cost of electrical energy consumed by them in one week at 3 Rs. Per unit.
19. a. Explain why did Rutherford select a gold foil in his alpha scattering experiments?

    b. what observations in a scattering experiment led Rutherford to make the following observations:

        i) Most of the space in an atom is empty.

        ii) Nucleus is positively charged.

    c. Mention ant two drawbacks of Rutherford's model.

20. What are the causes, symptoms and methods of prevention and cure of Tuberculosis (TB)?
21. a. Why is the ceiling and wall behind the stage of good conference halls or concert halls made curved?

    b. Which property of sounds leads to the formation of echoes? Briefly explain.

    c. What is reverberation? What will happen if the reverberation time in a big hall is too long? How can we reduce it?
22. a. what are the characteristics of sound waves?

    b. An echo is heard after 3 s. what is the distance of reflecting surface from the source given that the speed of sound is 342 ms^{-1} ?

    c. What is SONAR? Write its full form.
23. OTBA
24. OTBA

Section B

25. What does 5% solution of two given salts mean in chemical reaction to verify the law of conservation of mass.
26. Write some characteristics of birds.
27. A metallic cuboid of mass 9 kg and dimension 5 cm x 8 cm x 25 cm is placed on a table to exert pressure on its surface. If g = 10 m/s^2, the maximum pressure which can be achieved by the cuboid will be?
28. Barium chloride solution appears:

    a. blue b. blue-green

    c. yellow d. colourless
29. In the experiment to verify the law of conservation of mass weighing of the:

    a. reactants is only required b. products is only required

    c. reactants and the products are a must d. contents are not essential
30. Which of the following in the fern is below the soil?

    a. rhizome b. chloroplasts

    c. pyrenoids d. stem
31. Choose the option that describes the characteristics of the organism of the kingdom to which the mushroom belongs:

    a. unicellular prokaryotic organism b. saprophytic, eukaryotic, muticellular organism

    c. unicellular eukaryotic organism d. autotrophic eukaryotic organism

32. In pinus, leaves are:

a. needle like b. scale like

c. flat d. broad shaped

33. Which of the following is common among plants and animals?

a. both are prokaryotic b. both are eukaryotic

c. both are heterotrophic d. both are autotrophic

34. Hertz is S.I unit of

a. displacement b. wavelength

c. speed of wave d. frequency

35. The velocity of sound in a medium depends on

a. density b. elasticity

c. displacement d. amplitude

36. Upthrust depends on

a. volume b. density

c. ‘g’ d. all of these

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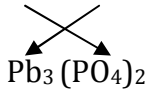
Solutions

1. Pb^{2+} PO_4^{3-}



$Pb_3(PO_4)_2$

2. Acute diseases are the diseases which last for very short periods of time.
3. If a body of weight 'W' is immersed in a fluid, such that upthrust 'U' acts on it due to the fluid, then the body sinks when

   W>U

   Body floats when W < U

   Body floats with its top surface completely immersed in fluid when

   W = U
4. Mg^{2+} is cation, O^{2-} is anion.
5. a. Bacteria protect themselves by making a cell wall.

   b. Rabies virus is spread by the bite of infected dogs and other animals.
6. Concrete sleepers help to reduce pressure exerted by train on the ground by increasing area of tracks.
7. The ions which are made up of more than one atom are called polyatomic ions.

   Ex. CO_3^{2-} and NH_4^+
8. a. Most of the rays passed through thin gold foil undeviated.

   b. Very fews rays came back in the same path.

   c. Some rays deflected through larger angles.
9. Malaria is a fatal disease of human being. It is caused by a protozoan parasite Plasmodium. This disease spread through bite of an insect vector.-The female Anophelas mosquito which feeds on human blood.

   Symptoms: Headache, nausea, muscular pain and high fever.

   Prevention: The only way to prevent malaria is to prevent mosquitoes from biting.

   Control: A drug, quinine is used to treat person suffering from malaria.

10. a. Vinay posssess the value of love for mankind and elderly people.

    b. A cancer paitent can live longer if he continues to get the same love and respect from the society. Vinay can spent time with his grandfather by talking to him, playing with him and making him feel that all love and respect him.

11. Taxonomy is the process of identification, nomenclature and classification of organisms, whereas systematic is the practice of identification, nomenclature, classification and study of evolutionary relationship among organisms.

12. Antibiotics block the bacterial process that build cell wall in bacteria. As a result, the growing bacteria become unable to make cell wall and die easily. But viruses do not have their own pathways and hence antibiotics do not work against virus.

13. Buoyancy is defined as the upward force exerted by a fluid on an object immersed in it.

    When the buoyancy of a liquid is greater than the weight of the weight of the object, it floats. However, when the buoyancy of liquid is less than the weight of the object, it sinks.

14. a. No. The buoyant force exerted upon a given body by the fluid is equal to the weight of the fluid displaced by it.

    b. M ass (m) = 395 g

    Volume (V) = 100 cm^3

    Density = m/V = 395/100 = 3.95 g/cm^3

    Relative Density = density of substance/ density of water

    = 3.95/1

    = 3.95

15. $W = 1/2\ m\ (v^2 - u^2)$

    = ½ x 4 x (400 – 100) = 600 J

    Power = W/t = 600 J/5s

    = 120 W

16. Sound of single frequency is called tone.

    T = 1/V = 1/500 = 0.002 s

17. F = 10 N

    m = 2 kg

    t = 3 s

    $\alpha = F/m = 10N/2kg = 5\ m/s^2$

    For $u = 0$, $v = at = 5 \times 3 = 15\ m/s$

K.E = ½ mv^2 = ½ x 2 x $(15)^2$ = 225 J

18. Total power, P = 40 W x 2 = 80 W = 0.08 kW

    Energy consumed = Pt = 0.08 x 56 = 4.48 kWh

    Cost of 1 kWh = 3 Rs.

    Cost of 4.48 kWh = 4.48 x 3 = 13.44 Rs.

19. a. It is because very thin foil of gold can be made.

    b. i) Most of the rays passed undeviated.

    ii) Some of the rays were deflected by large angles.

    c. Drawbacks of Rutherford's Model of an Atom:

    Any charged particle when accelerated is expected to radiate energy.

    To remain in a circular orbit, the electron would need to undergo acceleration. Therefore, it would radiate energy.

    The loss of energy would lead to shrinking of the orbit in size. In short time, it would hit the nucleus. Therefore, an atom cannot be expected to be stable.

20. Cause: Tuberculosis is caused by a bacterium called Mycobacterium Tuberculosis. The bacterium releases a toxin called tuberculin.

    Symptoms: The person suffering from T.B shows the following symptoms:

    a. Feels sick and weak.

    b. Loss of apetite and body weight.

    c. Night sweats and typical periodic fever. The fever rises in the afternoon and falls in the morning.

    d. In case of lung T.B the paitent has persistent cough and blood-stained sputum.Chest pain and breathlessness are common.

    e. In case of lymph gland T.B, the lymph glands show swelling, often in the leg and secretions through the skin.

21. a. The ceiling and wall behind the stage of conference halls and concert halls are made curved so that the reflected sound from them spreads evenly across the width of the hall.

    b. The property of sound to get reflected from a surface of solid or liquid, and to persist in our brain for a very short time (= 0.1 s) leads to formation of echoes.

c. The repeated reflection of sound that results in its persistence is called reverberation. Excessive reverberation for too long overlaps with subsequent original sound and makes it unclear to hear. To reduce reverberation, roofs, seats and walls of the hall covered with sound absorbent material such as compressed fibre board, draperies or rough plaster.

22. **a.** A sound wave is characterized by its i) pitch ii) loudness iii) quality

i) Pitch is a relative character dependent on frequency of sound wave. More the frequency, more will be the pitch and vice versa. A low pitched sound will have less number of oscillations per unit than a high pitched sound.

ii) Loudness or softness is due to the amplitude of the sound. If the amplitude is more, louder will be the sound. Louder sound is caused by the external force of larger magnitude. This is purely relative as " A sound louder for a person can be mild or soft for another." This depends on intensity which is the amount of energy passing through unit area in one second.

iii) Quality of sound is a perception used to distinguish the effect of sound in human ear. Two sounds having same loudness and pitch may differ in their quality.

Tone- A sound of single frequency is called a tone.

Note- Series of mixed frequencies produced is called a note.

b. Since t=3s, $v=342ms^{-1}$, $t=2d/v$

$d= vt/2 = 342 \times 3/2 = 171 \times 3 = 513$ m

c. SONAR is a device that uses ultrasonic waves to measure the distance, direction, and speed of the various moving bodies under water.

SONAR consists of:

i) Transmitter- which releases powerful pulses of ultrasonic frequencies into the sea.

ii) Receiver- which detects and records the reflected ultrasonic signals.

SONAR refers to Sound navigation and ranging.

23. OTBA

24. OTBA

25. 5 g salt is dissolved in 95 g of water.

26. a. They are warm blooded animals.
    b. Heart is four-chambered.
    c. They lay eggs.
    d. Body is covered with a feathery endoskeleton.
    e. Jaws are modified to form a strong beak.

27. 22500 Pa
28. (d)
29. (c)
30. (a)
31. (b)
32. (a)
33. (b)
34. (a)
35. (b)
36. (b)