

**CLASS –IX
SCIENCE**

Time: 3 to 3½ Hours

**M.M. : 90
Total No. of Pages :-**

General Instructions:

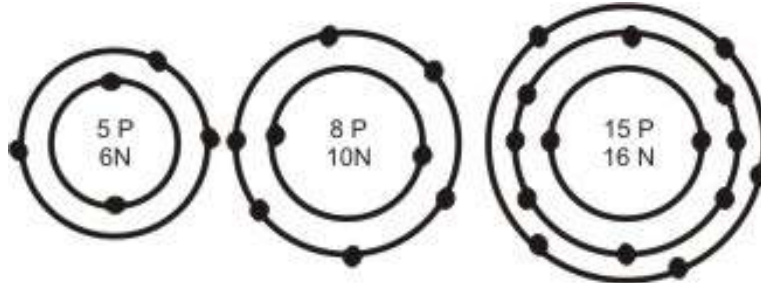
SECTION –A

- Q.1. Name the S.I. Unit of Pressure. 1
- Q.2. Define the commercial unit of electrical energy. 1
- Q.3. In which type of plants are Nitrogen fixing bacteria present. 1
- Q.4. a). How did Rutherford come to the conclusion that most of the space in an atom is empty? 2
- b.) Why do isotopes of an element show similar chemical properties? 2
- Q.5. Find the relative density of copper block of mass 216g having volume of 80cm^3 (Density of Water = $1\text{g}/\text{cm}^3$). 2
- Q.6. How do angiosperm differ from gymnosperms?
Write one example each? 2
- Q.7. List any two differences between longitudinal waves and transverse waves. 2
- Q.8. List any three human activities which would lead to an increase in the carbon dioxide content of air. 3

Q.9. What information do you get from the figure given below about the atomic number, at mass number and valency of atoms X, Y and Z.

Give your answer in tabular form.

3



Q.10. Define Sanyam and Svasthya? How are the two related?

3

Q.11. Write the given statement in your answer books after filling in the blanks?

3

- Pila and Unio have an external shell and belong to the phylum_____.
- Free living marine animals with water driven tube system are in the phylum _____.
- To which phylum do sponges belong_____.

Q.12. Differentiate between monocots and dicots. Give two differences and one example of each?

3

- Q.13. (a) State the law of Constant Proportion.
(b) In a compound Carbon and Oxygen react in a ratio 3: 8 by mass to form carbon dioxide. What mass of oxygen is required to repeated to react completely with 9g Carbon?

3

Q.14. (a) Calculate the number of molecules present in 4.4g of CO_2 . [At Mass: C=12, O=16 u, $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$]

- (b) What are polyatomic ion? Give one example.

3

Q.15. (a) What are the conditions for work to be done?

(b) An electric bulb of 60W is lighted for 10 hours a day. What is the amount to be paid in a month of 30 days, if one unit of electricity costs Rs. 3.50? 3

Q.16. (a) On which characteristics of sound wave do the following properties depend? 1+2

(i) loudness (ii) Pitch

(b) Calculate the time for which the sensation of sound persists in our brain if the minimum distance of the obstacle from the source of sound is 17.2m (speed of sound in air =344m /s)

Q.17. (i) State 'Archimedes' principle'. 1+2

(ii) The volume of 50g of a substance is 20 cm³. If the density of water is 1gm cm³, will the substance float or sink?

Q.18. (a) What is the causal organism for Swine flu? 1+2

(b) Suggest two measures that the local authorities of your neighbourhood should take to bring down the incidence of diseases like malaria, typhoid and dengue?

Q.19. List any three ways of preventing the spread of air borne diseases. 3

Q.20. a) A child hears an echo from a cliff 4 seconds after the sound from a powerful cracker is produced. How far away is the cliff from the child. Speed of sound = (340 m/s).

b) Derive a relation between wave length, frequency and wave velocity.

Or

Draw a neat labeled structure of human ear and its working. 5

Q.21. Give reasons for the following:

(a) Bryophytes are called "amphibians of the plant kingdom."

(b) Spiders and scorpions are very different from each other but are placed in the same phylum –Arthropoda.

- (c) Platyhelminths and Nematodes possess a Pseudocoelom.

Write the name of the following:-

- (a) Body is segmented
(b) Reptile which has four chamber heart. 5

Or

Write the main characteristics of phylum Porifera and Aves give one example of each with its diagram.

Q.22. An Element "X" has 13 protons, 13 electrons and 14 neutrons.

Answer the following questions:

- a) What is its atomic number of 'X'?
- b) Identify the element.
- c) What is its valency? What is the number of valence electrons is "X"?
- d) What is the type of ion formed by "X" ? Why?
- e) Name the scientists who discovered electrons and protons.

Or

- (a) Describe Bohr's model of an atom.
- (b) Draw a sketch of Bohr's model of an atom with 3 shells.
- (c) What was the drawback of Rutherford's model of an atom? 5

Q.23. (a) Prove the law of conservation of energy for a stone moving vertically down.

- (b) A boy of mass 50kg runs up a staircase of 45 steps in 9s. If the height of each step is 15cm, find his power [$g = 10 \text{ ms}^{-2}$]

Or

- (a) Define the term 'kinetic energy'.
- (b) Derive an expression for kinetic energy for an object of mass 'm' moving with a velocity 'v'.
- (c) Certain force acting on a 20 kg mass changes its velocity from 5m/s to 2 m/s. Calculate the work done by the force. 5

- Q.24. (a) What are the green house gases? 5
- (b) Give a diagrammatic representation of Carbon Cycle in nature.

Or

- (a) List four main processes involved in the water cycle.
- (b) Give a diagrammatic representation of Nitrogen cycle in nature.

SECTION-B

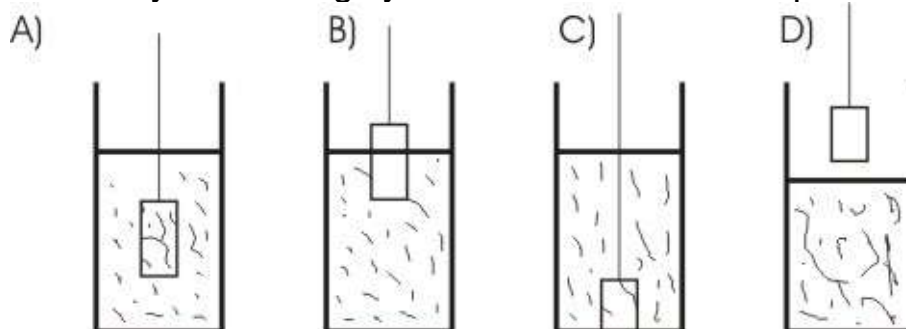
25. S.I. Unit of density is :-

- | | |
|-------------------|--------------------|
| a) g/m^3 | b) kg/m^2 |
| c) g/m^2 | b) kg/m^3 |

26. The density of salty water as compared to the density of pure water is always.

- | | |
|---------|------------------|
| a) Less | b) more |
| c) same | d) keep changing |

27. In the experiment to find the density of a solid block, the volume is measured by measuring cylinder. The correct set up is shown in:-



35. To which group would a plant that Produces flowers belongs?
- a) Bryophyta b) Pteridophyta
c) Gymnosperms d) Angiosperms
36. On which types of fishes are the gills covered with operculum?
- a) Bony fish b) Cartilaginous fish
c) Both (a) and (b) d) neither (a) nor (b)
37. The outer ear is called
- a) Pinna b) Malleus
c) Incus d) stapes
38. Matter can neither be created nor be destroyed in law of:
- a) conservation of mass b) Multi-proportion
c) Constant proportion d) None of these
39. Acid rain contains:-
- a) oxides of carbon b) oxides of nitrogen
c) oxides of carbon & sulphur d) Oxides of nitrogen & sulphur
40. BCG vaccine is used to curb:
- a) Pneumonia b) Tuberculosis
c) Polio d) Amoebiasis
41. Potential energy of a person is minimum when:
- a) Person is standing b) person is sitting in a chair.
c) Person is sitting on the ground d) Person is lying on the ground.
42. An object of mass 5 kg falls from a height of 5 m above the ground. The loss of potential energy of the mass is:-
- a) 250 J b) 25 J
c) 2.5 J b) 50 J

SUMMATIVE ASSESSMENT -II
ANSWER KEY

SECTION –A

- Q.1. Newton /Metre ² or Pascal. 1
- Q.2. If 1 kW of power is consumed by an appliance in 1 hour ,
the energy spent is said to be 1 kWh. 1
- Q.3. Leguminous plant 1
- Q.4. a) As most of alpha particles passed straight through the
gold foil, Rutherford concluded that most of the space
inside the atom is empty. 1
- b) As isotopes have same number of electrons so
they –have same chemical properties. 1
- Q.5. Density of block = Mass/volume = 216/80 = 2.7 g/cm³
Relative density = Density of a substance /
Density of water = 2.7/1=2.7 1
1

Q.6. 2

Sr. No.	Gymnosperm	Angiosperm
1	They produce cones formed of sporophylls	Presence of fruits, flowers and seeds
2	The sporophylls carry male and female sex organs.	Presence of xylem and vessels
3	The plants bear naked seeds, e.g. Pinus, Deodar	Presence of distinct root, stem and leaves e.g. Mustard, Plant, lemon

Q.7. 2

Sr. No.	Longitudinal waves	Transverse waves
1	The individual particles of the medium move in a direction	The individual particles of the medium move about their mean positions in a

	parallel to the direction of propagation of the disturbance.	direction perpendicular to the direction of wave propagation.
2	Sound is a longitudinal wave	Light is a transverse wave.
3	They travel in the form of compression and rarefaction	They travel in the form of crest and trough.

- Q.8. i) Burning of fossil fuels such as petrol diesel, transportation and industrial purpose. 3
- ii) Burning of wood and charcoal for heating and cooking.
- iii) cutting of trees /deforestation.

Q.9. 3

Atms	Atomic no.	Mass no.	Valency
X	5	11	3
Y	8	18	2
Z	15	31	3,5

Q.10. I have the feeling of Sanyama for the body and the body has Svasthya, Sanyam is basic to Svasthya. Sanyam is the feeling of responsibility in the self to ensure the nurturing, protection and right utilization of the body. Svasthya has two elements one that body acts according to the self and secondly there is a harmony between the parts of the body. 3

- Q.11. (a) Mollusca
(b) Echinodermata
(c) Porifera 3

Q.12. Monocots- One cotyledon/ parallel venation/ fibrous roots, wheat, maize, rice.
Dictos- Two cotyledons /reticulate venation/tap root, green gram, pea. 3

Q.13. (a) In a chemical substance the elements are always present in definite proportion by mass.

(b) For 3g of Carbon, 8g of Oxygen are needed.

(c) For 1g of Carbon, $\frac{8}{3}$ g of Oxygen are needed.

(d) For 9g of Carbon, $\frac{8}{3}$ g \times 9g = 24g Oxygen are needed. 3

Q.14. (a) Number of molecules of Na_2SO_4 = No. of moles \times 6.022×10^{23}
Number of moles = $\frac{71}{142} = 0.5$
Number of molecules = $0.5 \times 6.022 \times 10^{23} = 3.011 \times 10^{23}$

(b) A group of atoms carrying a charge are called poly atomic ions
e.g. SO_4^{2-} 3

Q.15. a) Two conditions need to be satisfied for work to be done:

(i) a force should act on an object, and

(ii) the object must be displaced.

b) $P = 60\text{W}$, $t = 10$ hours

$E = P \times t = 60 \times 10 = 600 \text{ Wh} = 0.6 \text{ kWh}$

Bill = $0.6 \times 3.5 \times 30 = \text{Rs. } 63$ 3

Q.16. (a) Loudness depends on amplitude while pitch depends on frequency.

(b) $2d = v \times t$

$2 \times 17.2 = 344 \times 7$

$T = \frac{34.4}{344} = 0.1\text{s}$ 3

Q.17. (i) Archimedes principle states that when a body is immersed fully or partially in fluid (liquid) it experiences an upward force that is equal to the liquid (fluid) displaced.

(ii) In present problem density of water

$\rho_w = 1 \text{ gm cm}^{-3}$

mass = 50 gm

Volume = 20 cm^3 3

(iii) Density of substance = $m/v = 50 \text{ gm} / 20 \text{ cm}^3 = 2.5 \text{ gm cm}^{-3}$,
greater density will sink. So it will sink.

Q.18. (a) Virus (H_1N_1)
(b) Spraying pesticides/ cleaning of garbage dumps/ disposal of sewage /cleaning of drains and sewers. 3

Q.19. • Avoiding direct contact with the infected persons
• Not sharing articles used by infected persons
• Use of mask/gloves/handkerchief 5

Q.20. (i) (a) Time taken by sound to travel from child to cliff
 $t = 4/2 = 2\text{S}$
 speed of sound in air, $v = 340 \text{ m/s}$
 Distance of cliff from the child = $v \times t = 340\text{m/s} \times 2 \text{ s} = 680 \text{ m}$
 b) Since wave length is the distance travelled by the wave during the time particle of the medium complete one vibration, therefore, if λ wave length and T is the time period, then the wave travels a distance λ in time T, hence wave velocity = Distance/ time or $\lambda = V \times T$ or $V = \lambda / T$ or

Parts

5



- 1) Pinna
- 2) Hammer
- 3) Anvil
- 4) Starup
- 5) oval window
- 6) auditory nerve
- 7) Cochlea
- 8) Eardrum or tympanic Membrane
- 9) auditory canal
- 10) Eustachian tube

Q.21. (i) They are found on land but need water to complete their life cycle.

- (b) They possess jointed legs.
- (c) True internal body cavity is absent

(ii) a) Earth worm

b) Crocodile

5

Porifera	Aves
Organisms are non motile / mostly marine/having pores/ simplest multicellular/ diploblastic / canal system/ skeleton/ Calcareous or siliceous e.g. Euspongia / spong/ sycon.	Warm Blooded / fore – limbs modified into wings / adaptation flight / four chambered heart / uricotelic animals / bones are air space light and spongy e.g. Birds

Q.22. (a) 13 (b) A1 (c) Valency , Valence Electrons = 3

(d) Ion formed by x = Cat ion as it needs to lose 3 electrons to acquire an octate

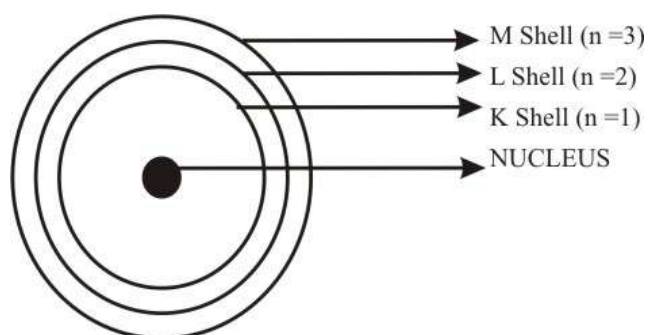
(e) Discoverer of proton = E Goldstein and that of electron was JJ Thomson

OR

(a) Only certain special orbits called discrete orbits are present in an atom.

While revolving in Discrete orbits, the electrons do not radiate energy.

(b)



(c) The orbital revolution of the electrons is not expected to be stable. Any particle in a circular orbit would undergo

acceleration during which charged particles would radiate energy and fall into the nucleus. However this is not so as atoms are highly stable.

5

23. (a) Consider a ball at a height h above the ground, say at point A

At A \rightarrow P.E. = mgh , K.E. = 0

Total energy = $mgh + 0 = mgh$

Now let it fall freely from this height

At point B at a height $h/2$

P.E. = $mgh/2$,

K.E. = $\frac{1}{2}mv^2 = \frac{1}{2} \times m \times (2gh/2) = mgh/2$

Total energy = $mgh/2 + mgh/2 = mgh$

At point C just above the ground

P.E. = 0, K.E. = $\frac{1}{2}mv^2 = \frac{1}{2} \times m \times 2gh = mgh$,

Energy at A = Energy at B = Energy at C

(b) Weight of the boy, $mg = 50 \text{ kg} \times 10 \text{ ms}^{-2} = 500\text{N}$

Height of the staircase, $H = 45 \times 15 / 100 \text{ m} = 6.75\text{m}$

Time taken to climb, $t = 9\text{S}$

Power, $P = \text{Work done} / \text{time taken}$

= mgh / t

= $500 \text{ N} \times 6.75 \text{ m} / 9\text{S}$

= 375 W.

5

OR

(a) Kinetic energy is the energy possessed by an object due to its motion

(b) **DERIVATION :**

Consider an object of mass, m moving with a uniform velocity, u . Let it now be displaced through a distance S when a constant force, F acts on it in the direction of its displacement.

The work done, W is $F s$

The work done on the object will cause a change in its velocity.

Let its velocity change from u to $-v$

Let a be the acceleration produced.

$$\text{K.E.} = W = FS = mas = \frac{1}{2} m (v^2 - u^2), \text{ From } v^2 - u^2 = 2as$$

$$\text{If } u = 0, \text{ K.e.} = \frac{1}{2} mv^2$$

(d) $W = \text{change in 'kinetic energy'} = \frac{1}{2} m (v^2 - u^2)$

$$= \frac{1}{2} \times 20 \times (4 - 25)$$

$$= \frac{1}{2} \times 20 \times (-21) = -210 \text{ J}$$

- Q.24. (a) Green house gases (i) CO_2 (ii) CH_4
(iii) Nitrogen Oxide (iv) Chlorofluoro Carbon

- (b) Refer to fig – 14.7 on pg- 199 of NCERT 5

OR

- (a) - Evaporation – Condensation – Transpiration – Precipitation

- (b) Refer to fig – 14.6 on pg – 198 of NCERT

SECTION -B

- Q. 25. (d) kg/m^3
- Q. 26. (b) More
- Q.27. (a) A
- Q.28. (a) doubled
- Q.29. (c) mixing of salts
- Q.30. (a) Walking
- Q.31. (a) loaded slinky
- Q.32. (b) conifers
- Q.33. (b) Gymnosperm
- Q.34. (b) Pileus and gill
- Q.35. (d) Angiosperm
- Q.36. (a) Bony fish
- Q.37. (a) Pinna
- Q.38. (a) conservation of mass
- Q.39. (d) oxides of nitrogen and sulphur
- Q.40. (b) tuberculosis
- Q.41. (d) Person is lying on the ground
- Q.42. (a) 250 J

