Half yearly Exam Answer Key – DEC 2024

Subject: SCIENCE Class: 10th STD E/M

PART – I Choose the Best answer: (1x14=14)

1. c) Change in Momentum	**5. a) 2**	**9. c) Melatonin**
2. b) – 0.25m, convex	**6. a) 95.5%**	**10. a) Charles Darwin**
3. c) Electrical energy	**7.b) mitochondrial matrix**	**11. d) Warming of earth**
4. c) 1/12th of the mass of a C-12 atom	**8.c)Atrium–Ventricle–arteries - vein**	**12. a) Script area**

PART- II – Answer the following:

13. The force acting on a body is directly proportional to the rate of change of linear momentum of the body. **F = m x a**

14. Sound and light:

S.NO	Sound	Light
1	Medium required for the propagation	Medium not required for the propagation
2	Longitudinal Wave	Transverse Wave
3	Velocity 340 ms^{-1}	Velocity – 3 x 10^8 ms^{-1}

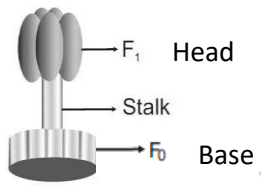
15. (i) Lead aprons should be used.
(ii) Dosimeters should be worn.

16. (i) Moisture (ii) Oxygen (iii) Water

17. A Combination reaction is a reaction is a reaction in which two or more reactants combine to form a compound.
It is otherwise called synthesis reaction or composition reaction.

$$H_{2\,(g)} + Cl_{2\,(g)} \rightarrow 2HCl_{\,(g)}$$

18.



19. (i) Increases fruits Size (ii) Increases flower size

20. (a) if both Assertion and reason are true and Reason is the correct explanation of Assertion.

21. (i) Script area (ii) Block menu (iii) Block Pallette

22. Solution: $I = \frac{P}{V} = \frac{100}{200} = 0.5\ A$

PART – III – Answer the Following:

23. Ideal Gas equation:

According to Boyle's law PV=Constant
According to Charle's law V/T = Constant
According to Avogadro's law V/n = Constant
n = μNA
PV / μNAT = Constant
PV = RT

Here $\mu N_A K_B$ = R is the universal gas constant **R=8.31 J $mol^{-1}K^{-1}$**

24. (a) When the source and the listener both are at rest and move in a constant distance.

(b) Ultrasonic Vibrations are sound vibrations with frequency greater than 20,000 Hz or 20 KHz.

25. Nuclear reactor:

Device in which the nuclear fission reaction takes place in a **self-sustained** and **controlled manner** to produce electricity.

(ANY 3 PARTS)

Fuel: A fissile material is used as the fuel. (Uranium)
Moderator: Used to slow down the high energy neutrons. Example: Graphite.
Control Rods: Used to control the number of neutrons. Ex: Boron, Cd rods.
Coolant: Used to remove the heat. Ex: Water
Protection Wall: Thick concrete Lead wall.

26. (a)

$$MgSO_4.7H_2O \xrightleftharpoons{Heating\ and\ cooling} MgSO_4 + 7H_2O$$

(b) Solubility:
Solubility is defined as the number of grams of a solute can be dissolved in 100g of solvent to form saturation solution at given temperature and pressure.

$$\text{Solubility} = \frac{Mass\ of\ the\ solute}{Mass\ of\ the\ solution} \times 100$$

27. - Used as solvent.
- Used to kill micro organism
- Used as an antiseptic
- Used as an anti-freeze in automobile radiator.

28. (a) Dental formula is $I\frac{2}{1}, C\frac{0}{0}, PM\frac{3}{2}, M\frac{3}{3}$ in rabbit. It Is written as $\frac{2033}{1023}$

(b) - Looping or crawling movement
- Swimming Movement

29. Vas deferens, Seminal Vesicle, Epididymis, Prostate Gland and Penis.

30. (a) Match the following:

	Part -1	Part – 2
1	Thyroxine	Simple goitre
2	Insulin	Diabetes Mellitus
3	Parathormones	Tetany
4	Growth hormone	Acromegaly

(b) (i) FALSE - Molecular scissors refers to Restriction Endonuclease.

(ii) FALSE – Golden rice is a not a hybrid. It is genetically modified.

31. (a) DISEASES CAUSED BY TOBACCO SMOKE:
i) Lungs and oral cancer
ii) Heart diseases
iii) Bronchitis
iv) Pulmonary tuberculosis
v) Gastric and ulcer

(b) Preventing measure heart disease:

- Regular exercise, walking and yoga.
- avoid alcohol consumption and smoking.
- Intake of low calories foods, Fibre diet like veg, fruits.

32. Solution:

Molar mass of $CaCo_3$ = (1 x 40) + (1 x 12) + (3 x 16)
= 40 + 12 + 48 = 100 gram

% of Calcium in $CaCo_3 = \frac{Mass\ of\ Calcium}{Molar\ mass\ of\ CaCo3}$ x 100

$= \frac{40}{100}$ x 100 = 40%

% of Carbon in $CaCo_3 = \frac{12}{100}$ x 100 = 12%

% of Oxygen in $CaCo_3 = \frac{48}{100}$ x 100 = 48%

PART IV – Answer the following:

33 (a)

(i) Properties of light:

i. Light is a form of energy
ii. Travels along a straight line
iii. Does not need any medium
iv. Different colored light has different wave length
v. Lowest wave length – violet, highest wave length – red

(ii) The blue colour with shorter focal length scatters to a greater extent causes the sky to appear in blue colour.

(OR)

33. (a) The rate of flow of charges in a conductor.

(b) The unit of current is ampere (A) One Coulomb of charge flows through the conductor in one second.

(c) Ammeter

(d) Series connection.

34. (a)

(i) Reason for alloying:

- to modify appearance and colour.
- to modify chemical activity.
- to lower the melting point.
- to increase hardness and tensile strength.
- to increase the resistance.

(ii) RUST:

When iron is exposed to moist air, it forms a layer of brown hydrated ferric oxide on its surface. It is called rust.

$4\ Fe + 3\ O_2 + xH_2O \rightarrow 2\ Fe_2O_3.x\ H_2O$

(OR)

(b)

(i) pH play on important role in everyday life: (ANY 5 Points)

1. Our body works within the pH range of 7.0 to 7.8
2. The ideal pH of blood is 7.4
3. The pH of saliva ranges between 6.5 to 7.5
4. In agriculture, the pH of soil is very important.
5. pH of the Stomach fluid is approximately 2.0
6. Our Stomach produced hydrochloric acid which helps in the digestion of food without harming the stomach.
7. White enamel coating of our teeth is calcium phosphate, the hardest substance in our body.
8. Sugarcane requires neutral soil.
9. The pH of rain water is approximately 7, which means that it is neutral and high purity.
10. If pH of rain water is less than 7, then it is called acid rain.

(ii) Soap and Detergent: (ANY TWO POINTS)

S.No	Soaps	Detergents
1	Soaps are does not used with hard water	Detergents are used with hard water
2	Biodegradable	Non - Biodegradable
3	It has poor foaming capacity	It has rich foaming capacity.
4	It is prepared from animal fats or vegetable oils.	It is prepared from hydrocarbons obtained from crude oil.

35. (a) Function of Brain:

i) Brain is covered by three connective tissue membrane or meninges.

ii) It is formed of three major parts.

iii) Forebrain – Cerebrum, Thalamus and Hypothalamus (Thinking, sensory and hunger)

iv) Mid brain – Corpora quadrigemina (Auditory reflexes)

(OR)

(b) (i) Importance of forest:

i) Forest are vital for human life
ii) Protect wildlife
iii) Reduce global warming
iv) Maintaining the ecological balance.
v) Flowering plants
vi) Dense tress
vii) Forest provides wood, food, fodder, fiber, and medicine.

(ii) If trees are cut down: (ANY TWO)

- Flood
- Drought
- Soil erosion
- Loss of wild life
- Extinction of Species
- Climate changes
- Desertification

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