

Section 'A'

68 marks

1. Blood, bone, ligament, tendon $\frac{1}{4} \times 4$
2. SO_2 and NO_2 . 1
3. When a bar magnet is brought closer to the mixture of iron filings and sulphur powder, iron particles stick to the magnet, while in case of iron sulphide, no change will be observed. When a mixture of iron and sulphur is added to carbon disulphide, sulphur dissolves while in case of iron sulphide no dissolution takes place. 1 + 1
[CBSE Marking Scheme, 2012]
4. Weeds take up nutrients and reduce the growth of the crop. Therefore, their removal is necessary.
Control method : Use of herbicides. 1+1
5. Horse is an animal whereas mango tree is a plant.
Plants and animals have different types of tissues because :
 - Plants do not show locomotion while most of the animals move from one place to another.
 - They have different pattern of growth - growth of plants is limited to certain regions whereas growth in animals is more or less uniform. 1 + 1
6. (a) One example in which both physical and chemical changes take place is burning of candle. Burning of wax is a chemical change; simultaneously it is melting also, which is a physical change.
(b) Chemical changes : Growth of plant, rusting of iron. 2 + $\frac{1}{2}$ + $\frac{1}{2}$

COMMONLY MADE ERROR



Few students fail to differentiate chemical change and physical change.

ANSWERING TIP...



Clearly differentiate the physical and chemical change and understand with the related examples.

7. (i) By dissolving iodine in alcohol.
(ii) **Solubility** : The amount of solute present in the saturated solution at a particular temperature is called its solubility.
(iii) The solute particles will settle down. [CBSE Marking Scheme, 2016] 1 + 1 + 1

8. (a) The elements are always present in a definite proportion by mass in a pure chemical compound. This is known as 'the law of definite proportion'. 1
- (b) Nitrogen and hydrogen combine in the ratio 14 : 3 by mass, which means that 14 gm of nitrogen combine with 3 gm of hydrogen.
 \therefore 42 gm of nitrogen will combine with $\frac{3}{14} \times 42$ gm of hydrogen = 9 gm of hydrogen $\frac{1}{2} + \frac{1}{2}$
- (c) The number of atoms constituting a molecule of that element is its atomicity. The atomicity of nitrogen is 2. [CBSE Marking Scheme, 2012] 1

9. (i) Most of the alpha-particles passed through the gold foil without getting deflected.
- (ii) Very few particles were deflected from their path by 180° , indicating that whole mass of the atom is present at its centre.
- (iii) Few particles deflected at small and large angles from their path indicating that centre is positively charged. 1 \times 3
- [CBSE Marking Scheme, 2016, 2012]

10. Tissue 'A' – Adipose tissue — Present just below the epithelium 1½ + 1½
 Tissue 'B' – Cardiac muscle — Present in the heart

OR

A person is most likely to fall sick in (c) condition because malaria attack has caused large scale destruction of her blood cells so she is weak and anaemic. Then she is on a four-day fast, which means she is not getting proper and sufficient food, which further decreases the functioning of her immune system and lastly chickenpox is a communicable and contagious disease. 3

11. (a) Velocity = 2 m/s
- (b) Uniform velocity
- (c) Distance covered = area of Δ AOB

$$= \frac{1}{2} \times OB \times AB$$

$$= \frac{1}{2} \times 4 \times 2 = 4 \text{ m}$$
 1 \times 3 = 3

12. The stone is being dropped freely from rest, so the initial velocity of the stone, $u = 0$. Again, the velocity of the stone is increasing as it comes down, so the acceleration due to gravity 'g' is to be taken as positive.

Here, Initial velocity $u = 0$ m/s

Time taken $t = 2.0$ s

Let h be the height of the bridge

Apply 2nd kinetic equation;

$$h = ut + \frac{1}{2}gt^2$$

$$= [0 + \frac{1}{2} \times 9.8 (2.0)^2] \text{ m}$$

$$= 19.6 \text{ m}$$

or,

or,

[CBSE Marking Scheme, 2012] 3

ANSWERING TIP...



Revision of formulae is necessary.

13. (a) 1
- | | | | | | |
|---|---|---|---|---|---|
| ● | ◆ | ● | ◆ | ● | ◆ |
| ● | ◆ | ● | ◆ | ● | ◆ |
| ● | ◆ | ● | ◆ | ● | ◆ |
| ● | ◆ | ● | ◆ | ● | ◆ |

- (b) Soyabean + maize, finger millet + cowpea
 (c) (i) It ensures maximum utilisation of nutrients.
 (ii) It prevents pest and diseases from spreading to all plants.

1 + 1 + 1

14. Energy = Power × time

Bulbs consumption = $10 \times 100 \times 12/1000 = 12$ units

Fans consumption = $5 \times 110 \times 12/1000 = 6.6$ units

Daily = $12 + 6.6 = 18.6$ units

Cost = $18.6 \times 2 = ₹ 37.2$

[CBSE Marking Scheme, 2017] 3

OR

Given, Mass = m , $u = 2$ m/s, $s = 2m$, $v = 0$

Using equation, $v^2 - u^2 = 2as$

$$\Rightarrow 0 - 2^2 = 2 \times a \times 2$$

$$\Rightarrow a = -1 \text{ m/s}^2$$

1

From 1st condition $KE = \frac{1}{2} mu^2$

(i)

Let u' be the initial, velocity when KE is doubled

then $(KE)' = \frac{1}{2} mu'^2$

(ii)

Since, $\frac{(KE)'}{(KE)} = \frac{2}{1}$

$$\frac{1/2 mu'^2}{1/2 mu^2} = \frac{2}{1}$$

$$\text{or, } u' = \sqrt{2} \times u$$

$$u' = 2\sqrt{2} \text{ m/s}$$

Let s' be the distance at which it will stop

1

$$v^2 - u^2 = 2as'$$

$$\Rightarrow 0^2 - (2\sqrt{2})^2 = 2 \times (-1) \times s'$$

$$\Rightarrow s' = 4 \text{ m}$$

1

15. (a) It is called hertz.

(b) Frequency = $\frac{\text{Number of waves}}{\text{Time}}$

$$= \frac{256}{4}$$

$$= 64 \text{ Hz.}$$

1 + 2

[CBSE Marking Scheme, 2012]

16. (a) Chromatography

(b) Different colours will appear at different heights.

(c) Different colours have different rates of absorption.

(d) Applications : To separate colours in a dye; To separate drugs from blood. 1 + 1 + 1 + 2

[CBSE Marking Scheme, 2012]

17. <i>Scoliodon</i>	<i>Asterias</i>
Has a notochord	Absent
Has a dorsal nerve cord	Absent
Has paired gill pouches	Absent
Streamlined body	Absent
Two-chambered heart	Not present
Blood flows in blood vessels	Here water driven tube system
Belongs to phylum Pisces	Belongs to phylum Echinodermata. (Any five)

[CBSE Marking Scheme, 2017] 5

Detailed Answer :

<i>Scoliodon</i>	<i>Asterias</i>
Scoliodon belongs to phylum Pisces.	Asterias belongs to phylum Echinodermata.
It has a notochord	Notochord is absent
It has a dorsal nerve cord	Dorsal nerve cord is absent
It has a paired nerve cord	Paired nerve cord is absent
It has streamlined body	Body is not streamlined
It has two chambered heart	Two chambered heart is not present
The blood flows in blood vessels.	<i>Asterias</i> has water driven tube system

(Any five) 5

ANSWERING TIP...

 Understand the difference between *Scoliodon* and *Asterias*.

18. (a) 2 bulbs of 40 watts for 6 hrs.

$$E_1 \text{ bulb} = 2 \times 40 \times 6 = 480 \text{ W} = 0.48 \text{ kWh}$$

(b) $E_2 \text{ tube light} = 50 \times 8 \times 2 = 0.800 \text{ kWh}$

(c) $E_{TV} = 120 \times 6 = 0.720 \text{ kWh}$

$$\text{Total Energy} = 0.48 + 0.80 + 0.72 = 2.00 \text{ units}$$

$$\text{Rate} = ₹ 2.50 \text{ per unit}$$

$$\text{Cost per day} = 2 \times 2.50 = ₹ 5.00$$

$$\text{Cost of 30 days} = 5.00 \times 30 = ₹ 150$$

[CBSE Marking Scheme, 2016] 5

Detailed Answer :

$$\text{Electrical energy consumed in KWh, } E = \frac{(P \times t)}{1000}$$

(a) Given, for two bulbs : $P = 40 \text{ W}$ and $t = 6 \text{ hours}$

$$\begin{aligned} \text{Energy consumed by 2 bulbs} &= 2 \times \frac{(40 \times 6)}{1000} \\ &= \frac{480}{1000} \\ &= 0.48 \text{ kWh} \end{aligned}$$

(b) Given, for 2 tube lights : $P = 50 \text{ W}$ and $t = 8 \text{ hours}$

$$\begin{aligned} \text{Energy consumed by 2 tube lights} &= 2 \times \frac{(50 \times 8)}{1000} \\ &= 0.800 \text{ kWh} \end{aligned}$$

(c) Given, for a T.V:

$$P = 120 \text{ W and } t = 6 \text{ hours}$$

$$\text{Energy consumed by a TV} = \frac{120 \times 6}{1000}$$

$$= 0.720 \text{ kWh}$$

$$\text{Total Energy} = 0.48 + 0.80 + 0.72$$

$$= 2.00 \text{ units}$$

$$\text{As it is given, cost of 1 unit of electricity} = ₹ 2.50 \text{ per unit}$$

Therefore,

$$\text{cost per day} = 2 \times 2.50 = 5.00$$

$$\text{And cost of 30 days} = 5.00 \times 30$$

$$= ₹ 150.$$

5

19. (i) 1. Mitochondria, 2. Cytoplasm,
3. Ribosome, 4. Smooth Endoplasmic reticulum,
5. Rough Endoplasmic reticulum, 6. Nucleolus,
7. Nucleoplasm, 8. Nuclear membrane,
9. Centrosome, 10. Golgi apparatus

(ii) (a) Mitochondria, (b) Ribosome, (c) Nucleus

(iii) 1. Cell wall and 2. Plastids

$$\frac{1}{4} \times 10 + \frac{1}{2} \times 5$$

COMMONLY MADE ERROR



Few students misspell the terms such that they write 'Nucloplasm' instead Nucleoplasm.

ANSWERING TIP...



Diagram should be properly labelled.

20. (a) (i) Graph I; since velocity decreases with time.
(ii) Graph II; Since velocity is constant, the acceleration of the body is zero.
(iii) Graph III; since the velocity-time graph does not pass through the origin.
(b) $u = 0, a = 0.1 \text{ m/s}^2, t = 2 \text{ min} = 120 \text{ s}$, speed acquired $v = ?$ distance travelled $s = ?$
(i) As $v = u + at, v = 0 + 0.1 \times 120 = 12 \text{ m/s}$.
(ii) As $s = ut + \frac{1}{2}at^2, = 0 + \frac{(0.1 \times 120 \times 120)}{2}$
 $= 720 \text{ m}$

$$1 + 1 + 1 + 1 + 1$$

[CBSE Marking Scheme, 2012]

OR

- (i) OA – Uniform acceleration, AB – zero acceleration/constant velocity.
(ii) 20 m/s; zero/body comes to rest
(iii) Retardation = $\frac{(0 - 20)}{(40 - 30)} = -2 \text{ ms}^2$.
(iv) Distance between 10th and 30th second
 $= (30 - 10) \text{ s} \times 20 \text{ m/s} = 400 \text{ m}$
21. (a) Removal of useful components from the soil and addition of other substances, which adversely affect the fertility of the soil. This kills the diversity of organisms that lives in it. 2
(b) It destroys the soil structure by killing soil microorganisms that recycle nutrients in the soil. 1
(c) It will destroy biodiversity and cause soil erosion. $\frac{1}{2} + \frac{1}{2}$
(d) It helps in percolation of water into the deeper layers. 1

OR

Fumigation, is a method in which the insecticide solution is converted into fumes to kill the insects; fumigants are the insecticides which are used for making such fumes.

Example: EDB (Ethylene di-bromide).

In fumigation, the solution is converted into fumes and it is done during the storage of food grains whereas in spraying, the solution remains in liquid form and it is done either before or after the storage of food grains. 2 + 1 + 2

Section 'B'

12 marks

22. Watch or clock with a quiet tick. 2
23. Methylene blue is the other stain used to stain onion peel. Excess glycerine can be removed from the cover slip by using a piece of blotting paper. 2
24. Glucose in water – True solution
Milk in water – Colloid
Sand in water – Suspension
Soil in water – Suspension $\frac{1}{2} \times 4$
25. Ammonium chloride gets deposited on the cooler part of the funnel and solid common salt remains in the china dish. 2
26. Distance covered in, four to and fro motions
$$= 2 \times 4 \times 25 \text{ cm} = 200 \text{ cm} = 2 \text{ m}$$
$$\text{Time} = 2.8 \text{ sec.}$$
$$\therefore \text{Speed of pulse} = \text{Distance/Time}$$
$$= 2/2.8 = 0.71 \text{ m/s.}$$
 2
27. The adulterant of Arhar dal is metanil yellow. It is harmful for us as it causes paralysis. 1 + 1

OR

Green manures are used to maintain the nutrients and fertility of the soil in the field. For this reason, farmer grows guar prior to the sowing of crop seeds as guar mulched by ploughing into the soil, works as a green manure and enrich the soil by providing nitrogen and phosphorus to the soil. 2