



Aakash

+ BYJU'S

SOLUTIONS
FOR
MOCK TEST PAPER

Class - X

Science

Physics | Chemistry | Biology



Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005,
Ph.011-47623456

MM : 80

Mock Test Paper (Science) - Class-X (2023-24)

Time : 180 Min.

Hints and Solutions

SCIENCE

SECTION-A : Multiple Choice & Assertion-Reason Type Questions (20×1 = 20 Marks)

- A1. Answer : (1) ...[1 Mark]
- A2. Answer : (3) ...[1 Mark]
Solution:
Acetic acid is an organic acid.
- A3. Answer : (2) ...[1 Mark]
- A4. Answer : (3) ...[1 Mark]
- A5. Answer : (3) ...[1 Mark]
- A6. Answer : (2) ...[1 Mark]
- A7. Answer : (2) ...[1 Mark]
- A8. Answer : (3) ...[1 Mark]
- A9. Answer : (3) ...[1 Mark]
- A10. Answer : (1) ...[1 Mark]
- A11. Answer : (3) ...[1 Mark]
- A12. Answer : (2) ...[1 Mark]
- A13. Answer : (4) ...[1 Mark]
- A14. Answer : (2) ...[1 Mark]
- A15. Answer : (4) ...[1 Mark]
- A16. Answer : (2) ...[1 Mark]
- A17. Answer : (1) ...[1 Mark]
- A18. Answer : (3) ...[1 Mark]
- A19. Answer : (1) ...[1 Mark]
- A20. Answer : (1) ...[1 Mark]

SECTION-B : Short Answer Type Questions (6×2 = 12 Marks)

- A21. Solution:
In combination reaction, two or more reactants combine to form a single product whereas in double displacement reaction, two compounds react by exchange of ions to form two new compounds.
...[1+1 = 2 Marks]

A22. Solution:

- (i) It promotes cell growth.
- (ii) It induces bending movement in plants. When growing plants detect light, auxin is synthesised at the shoot tip that helps the cells to grow longer. When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light.
- (iii) It induces parthenocarpy in many plants. Formation of seedless fruits without fertilization is known as parthenocarpy.

(Any two) ...[2×1 Marks]

A23. Solution:

If the egg is not fertilised, it lives for about one day. The spongy and thick lining inside the uterus slowly breaks and comes out through the vagina as blood and mucous. This is known as menstruation.

...[2 Marks]

A24. Solution:

Children resemble their parents because both father and mother pass on genes to their children through gametes during sexual reproduction and these genes control expression of characters in the young ones. So, children can attain characteristics of either of their parents or may be of their grandparents too.

...[2 Marks]

OR

Solution:

	Autotrophs	Heterotrophs
(i)	They are producers, i.e., they produce or manufacture their own food.	They are consumers, i.e., they cannot synthesize their own food.
(ii)	They possess chlorophyll.	Chlorophyll is absent.
(iii)	They trap solar energy and convert it into chemical energy.	They cannot trap solar energy. Chemical energy is obtained from outside.
(iv)	They obtain inorganic nutrients from outside to synthesize their own food.	They obtain organic nutrients from outside as food.
(v)	They constitute the first trophic level.	They belong to second and higher trophic levels.
(vi)	They usually add oxygen to the environment.	They add carbon dioxide to the environment.
(vii)	Example: Plants and blue-green algae.	Example : Animals, many protists, bacteria and fungi.

(Any two) ...[2×1=2 Marks]

A25. Solution:

Yes, alpha particles being positively charged constitute a current in the direction of motion.

...[2 Marks]

A26. Solution:

When the light is very bright, the iris contracts the pupil to allow less light to enter the eye. However, in dim light the iris expands the pupil to allow more light to enter the eye.

...[2 Marks]

OR

Solution:

Far point of a normal adult person is infinity and near point of a normal adult person is 25 cm.

...[2 Marks]

SECTION-C : Short Answer Type Questions (7×3 = 21 Marks)

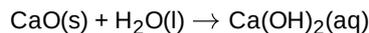
A27. Solution:

(a) Exothermic reactions : Reactions in which heat is released are called exothermic reactions.

...[1 Mark]

e.g. : Slaking of lime is an exothermic reaction.

...[0.5 Mark]

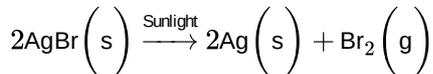


(b) Endothermic reactions : Reactions in which heat is absorbed are known as endothermic reactions.

...[1 Mark]

e.g. : Decomposition of silver bromide is an endothermic reaction.

...[0.5 Mark]



A28. Solution:

(a) Ionic compounds are solids and hard because of the strong attraction between positive and negative ions.

...[1 Mark]

(b) Ionic compounds are generally soluble in water and insoluble in solvents such as kerosene, petrol etc.

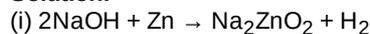
...[1 Mark]

(c) Ionic compounds have high melting and boiling points.

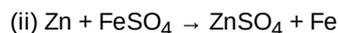
(Or any other property) ...[1 Mark]

OR

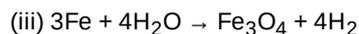
Solution:



...[1 Mark]

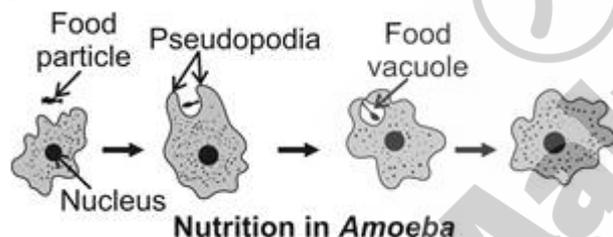


...[1 Mark]



...[1 Mark]

A29. Solution:



...[1 Mark]

Amoeba takes food using temporary finger-like extensions of the cell surface which fuse over the food particle forming a food-vacuole. Inside the food-vacuole, complex substances are broken down into simpler ones which then diffuse into the cytoplasm. The remaining undigested material is moved to the surface of the cell and thrown out.

...[2 Marks]

A30. Solution:

Function of following parts of brain are:-

(a) **Cerebellum**: Precision of voluntary actions and maintaining the posture and balance of the body.

(Any one) ...[1 Mark]

(b) **Cerebrum**: Main thinking part of brain which controls all voluntary actions of the body.

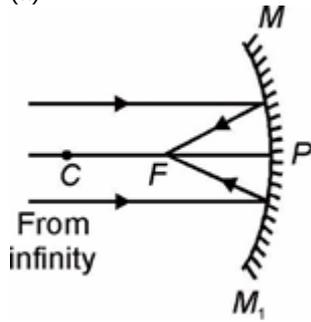
(Any one) ...[1 Mark]

(c) **Medulla**: Controls all involuntary actions including blood pressure, salivation and vomiting.

(Any one) ...[1 Mark]

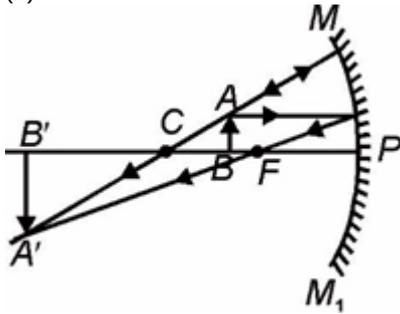
A31. Solution:

(a)



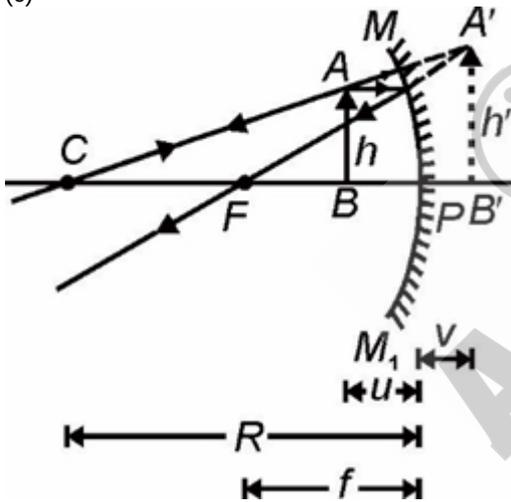
...[1 Mark]

(b)



...[1 Mark]

(c)



...[1 Mark]

A32. Solution:

Refractive index is the optical property of a medium. It is defined as the ratio of speed of light in air or vacuum to the speed of light in the medium.

...[1 Mark]

As a light ray travels obliquely from a rarer medium to denser medium, it bends towards normal at the interface. It happens because light travels slower in denser medium as compared to that in rarer medium. Thus it slows down in denser medium and bends towards normal.

...[2 Marks]

A33. Solution:

In this defect, a person is not able to see the distant objects clearly, however he can see the nearby objects clearly.

...[1 Mark]

This defect arises due to an increase in the curvature of the eye lens or a decrease in the focal length of the eye lens or elongation of the eyeball.

...[1 Mark]

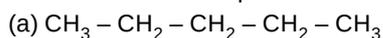
This defect can be corrected by using spectacles having diverging (concave) lens of suitable power.

...[1 Mark]

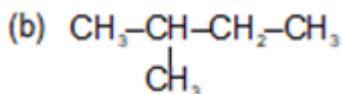
SECTION-D : Long Answer Type Questions (3×5 = 15 Marks)

A34. (i) **Solution:**

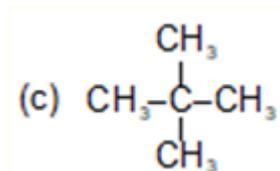
Structural isomers of pentane are



...[1 Mark]



...[1 Mark]



...[1 Mark]

(ii) **Solution:**

HCHO (Methanal/Formaldehyde)

...[0.5+0.5 Mark]

CH₃CHO (Ethanal/Acetaldehyde)

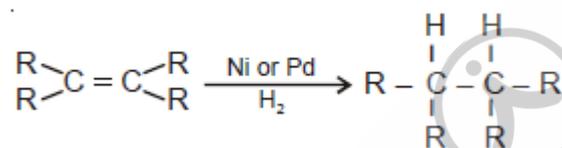
...[0.5+0.5 Mark]

OR

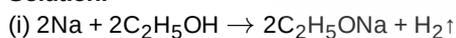
(i) **Solution:**

Unsaturated hydrocarbons are reduced in the presence of catalysts such as palladium or nickel to give saturated hydrocarbons.

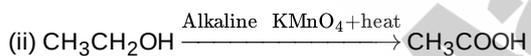
...[1 Mark]



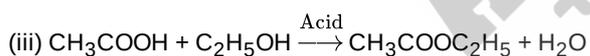
...[1 Mark]

(ii) **Solution:**

...[1 Mark]

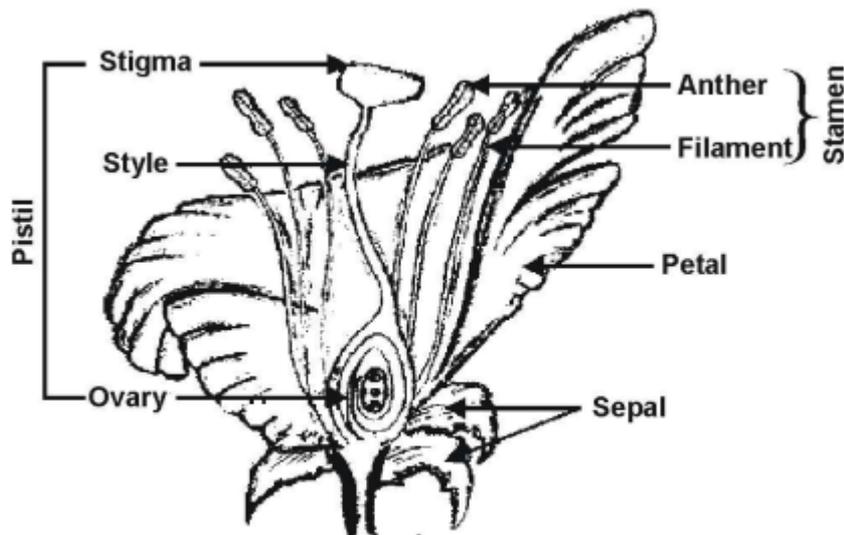


...[1 Mark]



...[1 Mark]

A35. Solution:



Longitudinal section of flower

[Diagram – 2
 ... Labellings – 4 × 0.5
 (Any four)]

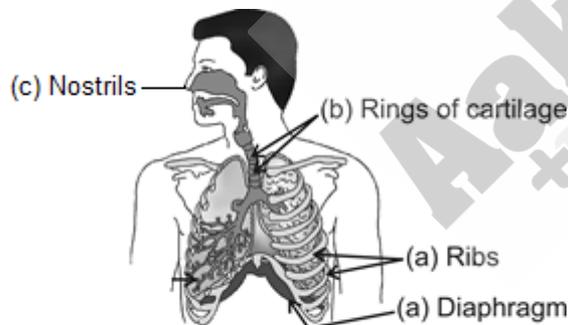
Carpel/pistil is the female reproductive part and consists of stigma, style and ovary. Carpels have a swollen ovary at the base, an elongated middle style and a terminal stigma which is sticky in nature. The ovary contains ovules. Each ovule has an egg cell, the female gamete.

...[1 Mark]

OR

Solution:

(i)



Human Respiratory System

...[Diagram-1, Labellings - 3×1 Marks]

(ii) Haemoglobin is a respiratory pigment which has a very high affinity for oxygen. In human beings, this pigment is present in red blood corpuscles.

...[1 Mark]

A36. Solution:

(i) **Active elements** : Elements of a circuit which provides electrical energy to circuit are called the active elements.

Example : Cell battery.

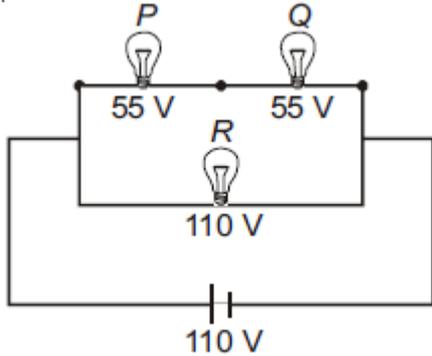
...[1 Mark]

Passive elements : Elements of a circuit which consume or store the electrical energy from the circuit are called the passive elements.

Example : Resistor, capacitor

...[1 Mark]

(ii)



$$P_P = P_Q = \frac{100}{(220/55)^2} = \frac{100}{16}$$

$$P_R = \frac{60}{(220/110)^2} = \frac{60}{4}$$

$$P_T = P_R + P_Q + P_P$$

$$\Rightarrow \frac{60}{4} + \frac{100}{16} + \frac{100}{16} = \frac{240+100+100}{16}$$

$$\Rightarrow \frac{440}{16} = 27.5 \text{ W}$$

...[3 Marks]

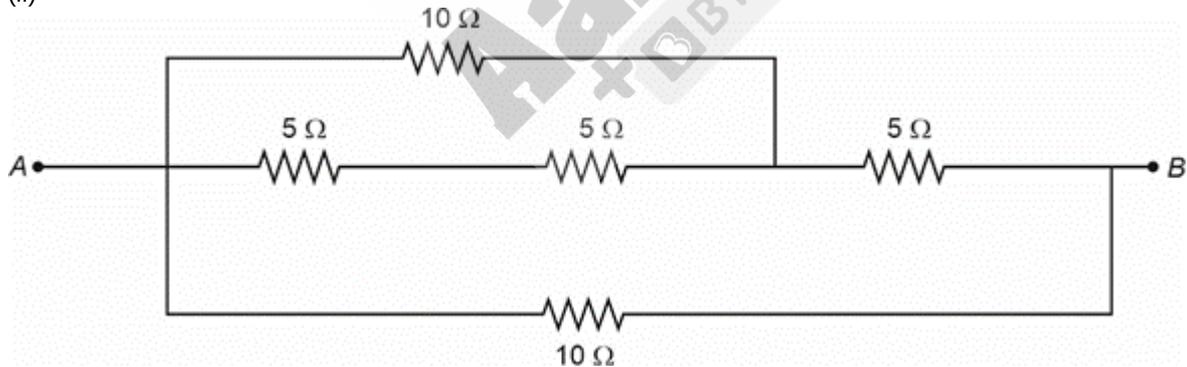
OR

Solution:

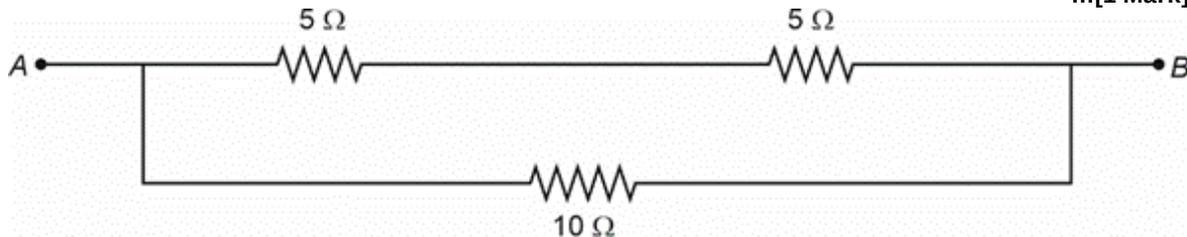
(i) If one of the devices connected in series stops working, then all other devices will also stop working. While in parallel if one device stops working other devices will keep working.

...[2 Marks]

(ii)



...[1 Mark]



...[1 Mark]

$$R_{eq} = \frac{10 \times 10}{10 + 10} = 5 \Omega$$

...[1 Mark]

SECTION-E : Source-based / Case-based Units of Assessment (3×4 = 12 Marks)

- A37. (a) Solution:**
The acids that partially ionise in the aqueous solution are called weak acids. ...[1 Mark]
Example: Acetic acid, Methanoic acid (Or any other) ...[0.5+0.5 Mark]
- (b) Solution:**
(i) The pH of sodium sulphate is equal to 7 ...[1 Mark]
(ii) The pH of sodium acetate is more than 7 ...[1 Mark]
- or**
- (b) Solution:**
(i) Gastric juice < Pure water < Milk of magnesia ...[1 Mark]
(ii) Hydrochloric acid < Tomato juice < Sodium hydroxide solution ...[1 Mark]
- A38. (a) Solution:**
A sequence of living organisms that shows the inter-dependence of organisms for their food is called food chain. ...[1 Mark]
- (b) Solution:**
Animals which directly feed on plants are called herbivores. ...[1 Mark]
- (c) Solution:**
(i) Decomposers are natural scavengers as they reduce the organic remains of the earth.
(ii) They provide space for newer generations of organisms in the biosphere.
(iii) They replenish the soil naturally with minerals that are essential for the growth of plants and hence for the maintenance of ecosystem. (Any two) ...[2 Marks]
- or**
- (c) Solution:**
Grass → Deer → Lion ...[2 Marks]
- A39.**
- (a) Solution:**
If the total current drawn through a wire by the appliances connected to it exceeds the safety limit for that wire, it gets overheated. We say that the overheating is due to overloading. ...[1 Mark]
- (b) Solution:**
When live and the neutral wires have come in contact accidentally, A very large current passes through the circuit, because the resistance between the wires is now almost zero. Such an event is called **short circuit**. ...[1 Mark]
- (c) Solution:**
Precautions in the use of electricity
To avoid the hazards like electric shocks or electric fires, we should observe the following precautions.
• If a person accidentally touches a live wire or if an electric fire starts in a house, the main switch should be turned off.
• To avoid the risk of electric shocks, metallic body of electric appliances should be earthed.
• The fuse should always be connected in live wire.
• All the switches should be connected in live wires.
• For wiring, good quality insulator wires should be used. (Any two) ...[2 Marks]

or

(c) **Solution:**

Advantage of AC over DC

- AC can be transmitted over long distance with a very low loss of energy in comparison to DC
- AC can be easily stepped up or down as per requirement.
- AC can be easily converted into DC with a device having very low cost. But for conversion of DC to AC we need a costly device.

[Any two] ..[2 Marks]





Aakashians Create History in International Olympiads (Classroom Students)

IBO 2023



Gold Medalists

34th International Biology Olympiad



Dhruv Advani



Rohit Panda



Chirag Falor



International Olympiad on
Astronomy & Astrophysics



Dhiren Bhardwaj



32nd International
Biology Olympiad



Anshul



32nd International
Biology Olympiad



Amritansh Nigam



33rd International
Biology Olympiad



Prachi Jindal



33rd International
Biology Olympiad



Tanishka Kabra



54th International
Chemistry Olympiad

Excellent Performance by Aakashians in NSEs, IOQM, NSO-II, IMO-II & INOs

201 Classroom Students
Aakashians Qualified
in NSEs
2022-23

63 Classroom Students
Aakashians Qualified
in IOQM
2023

783 774 Classroom +
09 Digital & Distance
Aakashians Qualified
in NSO (Level-II)
2023

601 590 Classroom +
11 Distance & Digital
Aakashians Qualified
in IMO (Level-II)
2023

39 Classroom Students
Aakashians Qualified
for OCSCs/IMOTC
/APMO 2023

NSEs - National Standard Examinations | IOQM - Indian Olympiad Qualifier in Mathematics | NSO - National Science Olympiad
IMO - International Mathematics Olympiad | INOs - Indian National Olympiads | OCSCs - Orientation cum Selection Camps,
IMOTC - International Mathematical Olympiad Training Camp, APMO - Asian Pacific Mathematics Olympiad

107009 Aakashians Qualified in
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(94893 Classroom + 12116 Distance & Digital)

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AIR 28
Aakash Gupta
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AIR 31
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