



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY | CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL



MID TERM EXAMINATION 2024-25
SCIENCE MARKING SCHEME (086)

Class: X
 Date: 23/09/2024

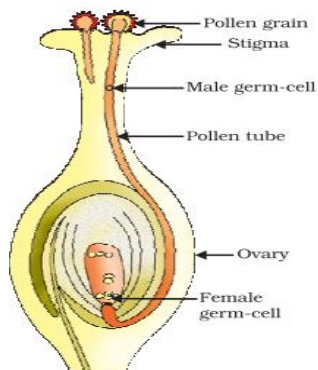
Duration: 3 Hr
 Max. Marks: 80

SECTION-A

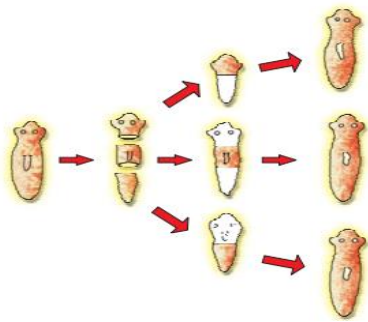
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|---|---|
| 1. (c) Vegetative propagation | 1 |
| 2. (d) To provide nutrients to the embryo. | 1 |
| 3. (a) Gustatory receptors detect taste while olfactory receptors detect smell. | 1 |
| 4. (d) (ii) and (iv) | 1 |
| 5. (d) 100%, 75% | 1 |
| 6. (c) Chemotropism | 1 |
| 7. (c) Adrenal | 1 |
| 8. (d) Between the pole of the mirror and its principal focus. | 1 |
| 9. (c) Ciliary muscles. | 1 |
| 10. (a) addition of oxygen | 1 |
| 11. (c) 2:1 | 1 |
| 12. (b) HCl | 1 |
| 13. (c) CaO | 1 |
| 14. (d) displacement | 1 |
| 15. (c) aqueous solution of sodium chloride | 1 |
| 16. (b) Mercury | 1 |
| 17. (a) Both A and R are true, and R is the correct explanation of A. | 1 |
| 18. (c) A is true but R is false. | 1 |
| 19. (a) Both A and R are true, and R is the correct explanation of A. | 1 |
| 20. (a) Both A and R are true, and R is the correct explanation of A. | 1 |

SECTION-B

- | | |
|----|---|
| 21 | 2 |
|----|---|



OR



(a) Regeneration is carried out by specialised cells. These cells proliferate and make large numbers of cells. From this mass of cells, different cells undergo changes to become various cell types and tissues. 1

(b) i) Bryophyllum leaf falls on the wet soil - buds produced in the notches along the leaf margin of *Bryophyllum* fall on the soil and develop into new plants 1

(ii) The blobs are sporangia, which contain cells, or spores, that can eventually develop into new *Rhizopus* individuals

22. Chemical coordination in plants is primarily achieved through plant hormones, also known as phytohormones. These are chemical substances that regulate various physiological processes and help plants respond to environmental changes. Auxins, Gibberellins, Cytokinins and Absciscic acid. 2

OR

Nervous System Structure: Composed of neurons (nerve cells) that transmit electrical signals rapidly across the body. Duration: Effects are usually short-lived. Examples: Reflex actions, muscle contractions, and sensory processing.

Hormonal (Endocrine) System: Composed of glands that secrete hormones into the bloodstream. Duration: Effects are usually longer-lasting. Examples: Regulation of metabolism, growth, and reproduction.

23. (a) 1 Dioptre is the power of a lens of focal length 1m. 1
 (b) $P = 100/f$ (cm) 1/2
 $= 100/-50 = -2D$ 1/2
24. The planets are much closer to the earth, and are thus seen as extended sources. If we consider a planet as a collection of a large number of point-sized sources of light, the total variation in the amount of light entering our eye from all the individual point-sized sources will average out to zero, thereby nullifying the twinkling effect. 2
25. Na loses an electron and Chlorine gains an electron get positively and negatively charged respectively and making an ionic compound. Diagram is needed 1
1
26. The sex of the children will be determined by what they inherit from their father. A child who inherits an X chromosome from her father will be a girl, and one who inherits a Y chromosome from him will be a boy. 2

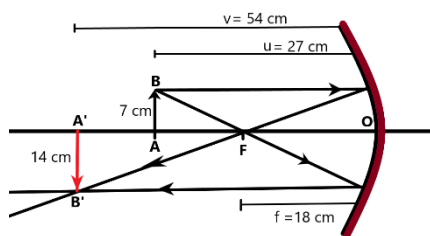
OR

Monohybrid cross to be explained. 1

Dominant trait and recessive trait. 1

SECTION-C

27. Blood group A- IA/IA or IA/IO 1
 Blood group B- IB/IB or IB/IO 1
 Daughter- IO/IO 1
28. (a) Diabetes 1
 (b) Insulin hormone secreted by pancreas. 1
 (c) Feedback mechanism- if the sugar levels in blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced. 1
29. (a) (i) The angle of incidence is equal to the angle of reflection when a beam of light strikes the reflecting surface. 1/2
 (ii) The reflected ray, incident ray, and normal lie on the same plane. 1/2
 (b) $1/f = 1/v + 1/u$
 $\Rightarrow 1/(-18)\text{cm} = 1/v + 1/(-27)\text{cm}$ 1/2
 $\Rightarrow 1/v = (2 - 3)/54$
 $\therefore v = -54\text{cm}$ 1/2



The image of the object which was kept 27 cm away from the mirror is formed at 54 cm in front of the mirror. The screen can be placed 54 cm to the left of the mirror to get the image. 1/2

Now,
 $h'/h = -v/u$ 1/2
 $\frac{1}{2}$
 $\Rightarrow h'/7\text{cm} = -(-54)/(-27)$
 $\Rightarrow h' = -7\text{cm} \times 2$

$\therefore h' = -14\text{cm}$

30. Object distance, $u = -15\text{ cm}$
 Focal length, $f = +10\text{ cm}$
 Object's height, $h = +2\text{ cm}$
 Image distance, $v = ?$
 Image height, $h' = ?$
 Using the lens formula, $1/v - 1/u = 1/f$ 1/2
- $1/v = 1/10 - 1/15$ 1/2
 $v = 30\text{ cm}$ 1/2

The positive sign of v shows that the image is formed at a distance of 30 cm on the right side of the lens. Therefore the image is real and inverted. 1/2

Magnification, $m = h'/h = v/u$

Putting all the values

$$h'/2.0 = +30/-15 = -2$$

1/2

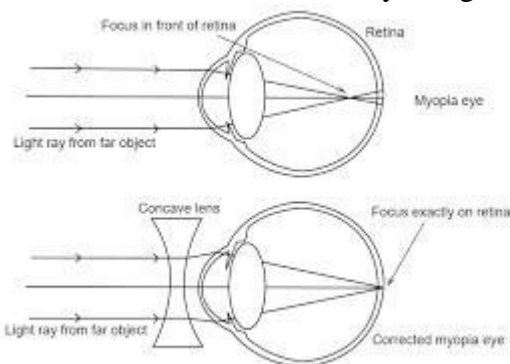
$$h' = -2 \times 2 = -4 \text{ cm}$$

Magnification, $m = v/u = 30/-15 = -2$

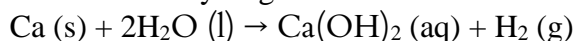
31. Myopia (short sightedness) is where the eye is longer than normal or the cornea is too steep, meaning that light rays focus in front of the retina. Near objects are clear, but distant objects appear blurred. 1

This defect may arise due to (i) excessive curvature of the eye lens (ii) elongation of the eyeball. 1

This defect can be corrected by using a concave lens of suitable power. 1



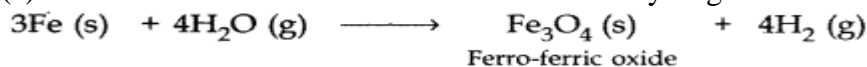
32. (a) The reaction of calcium with water is less violent. The heat evolved is not sufficient for hydrogen to catch fire. 3



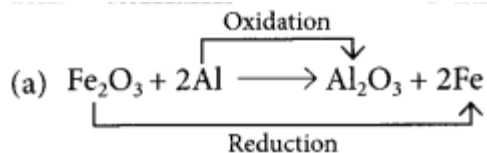
Calcium starts floating because the bubbles of hydrogen gas formed stick to the surface of the metal.

(b) Most of the metals do not give hydrogen while reacting with nitric acid because HNO_3 is a strong oxidising agent. It oxidises the H_2 produced to water and itself gets reduced to any of the nitrogen oxides (N_2O , NO , NO_2).

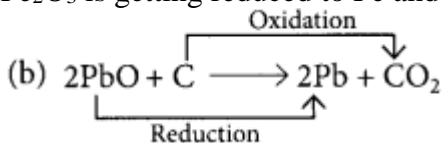
(c) Iron reacts with steam to form iron oxide and hydrogen



33. Those reactions in which two or more than two compounds combine to form a single substance. Called combination reaction 3



Fe_2O_3 is getting reduced to Fe and Al is getting oxidised to Al_2O_3 .



PbO is reduced to Pb and C is oxidised to CO_2 .

OR

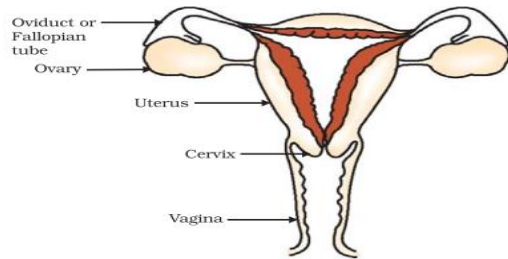
(a) Displacement reaction. (b) Combination reaction. (c) Double displacement reaction.

SECTION-D

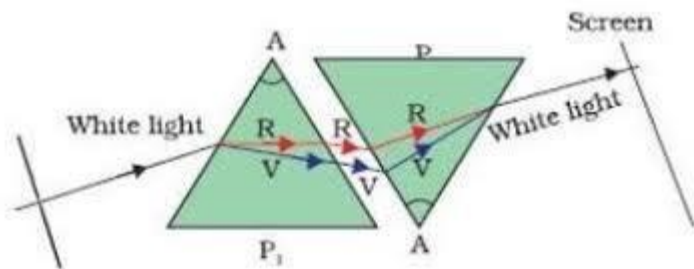
34. a) Infertility: The scrotum provides a cooler environment essential for sperm production. If the testes remain in the abdomen, the higher temperature can impair sperm production, leading to infertility. 1
- b) The blockage prevents sperm from being included in the ejaculate, resulting in infertility. The man will produce semen, but it will not contain sperm. 1
- c) These fluids contain important nutrients and substances that protect and facilitate the movement of sperm. Without them, sperm may not be viable or capable of reaching the egg. 1
- d) Menstruation 1
- e) The blockage prevents the sperm from reaching the egg, and the fertilized egg from reaching the uterus, leading to infertility. 1

OR

- a) Barrier/Mechanical, Chemical, IUCD, Surgical method 2



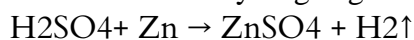
- b) 1
- c) Ovary-produce egg/ female sex hormone 1
35. (a) Power of accommodation is the ability of the eye lens to focus near and far objects clearly on the retina by adjusting its focal length. Power of accommodation of the eye is limited. It implies the focal length of the eye lens cannot be reduced beyond certain minimum limit. 2
- (b) Defect is Hypermetropia 1/2
- $$1/f = 1/v - 1/u$$
- $$= 1/(-80) - 1/(-25)$$
- $$= 11/400$$
- $$f = 400/11 \text{ cm}$$
- P = 100 / f (cm) = 2.7 D Or 1/2
- (a) When white light is passed through a glass prism it splits into its spectrum of colours (in order violet, indigo, blue, green, yellow, orange and red) and this process of white light splitting into its constituent colours is termed as dispersion. 1/2



(b) When a light beam goes through a medium, it hits the particles existing in them. Due to this phenomenon, some light rays get absorbed while a few get scattered in various directions. The intensity of the scattered light rays depends on the particles' size and wavelength.

36. (a) Adding water to acid produces a highly exothermic chemical reaction. The intensity of the heat formed can break the glass container or cause severe burns to the person diluting it.

(b) Hydrogen gas is liberated when an acid reacts with a metal. For example: Take some pieces of zinc granules in a test tube and add H₂SO₄ to it. Shake it and pass the gas evolved into a soap solution. Bubbles are formed in the soap solution. These soap bubbles contain hydrogen gas. The chemical equation of the reaction is:



Identification test- Hydrogen gas is identified by bringing a burning candle near the soapy bubbles. The candle will burn with a pop sound.

OR

(i) (a) In alkaline conditions, milk does not set as curd easily due to the formation of lactic acid as in the acidic condition.

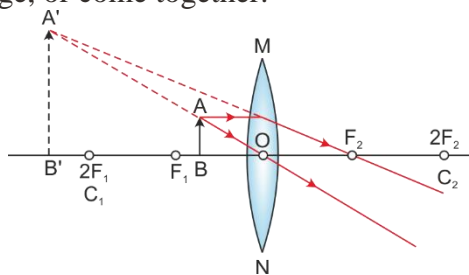
(b) Since this milk is slightly more basic than normal milk, acids produced to set the curd are neutralised by the base mix to the milk. Hence, it takes a longer time for the curd to set.

(ii) HCl is a stronger acid than CH₃COOH. Therefore, the H⁺ ions concentration in test tube A will be higher than in test tube B. Hence, the reaction will occur faster in test tube A than in test tube B. So, fizzing will occur more vigorously in test tube B.

37. (a) Position- At 'F', Size- Highly diminished

(b) Position- Between 'O' and 'F', Size- diminished

(c) A magnifying glass is a convex lens used to make an object appear much larger than it actually is. This works when the object is placed at a distance less than the focal length from the lens. A magnifying glass uses a convex lens because these lenses cause light rays to converge, or come together.



Or

(i) A real image is formed by the actual intersection of light rays whereas a virtual image is formed by the imaginary intersection of light rays.

(ii) A real image can be formed in a screen but a virtual image can be only seen in the mirror. (Any other difference is also acceptable)

38. a) Tall plants with round seeds 1
b) Short and wrinkled 1
c) Round-yellow:9, Round green:3, Wrinkled yellow:3, Wrinkled green-1 2

OR

If 1600 plants were obtained in F2 progeny 2

i) Tall with round seeds -900

ii) Short with wrinkled seeds- 300

39. (a) $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$ 2
(b) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + \frac{3}{2}\text{H}_2\text{O} \rightarrow \text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ 2

OR

(b) Sodium carbonate decahydrate $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$