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PATNA REGION
PRE BOARD-2 (2025-26) MARKING SCHEME
SET-1 CLASS – X SUB- SCIENCE

Section A: Biology

1. **C** – Right atrium receives deoxygenated blood from the body and sends it to the right ventricle.
2. **B** – Starch into simple sugars.
Saliva contains amylase that breaks starch into sugars, less saliva reduces this.
3. **D** – Blood pressure: Medulla in hindbrain.
4. **C** – Vegetative propagation.
For genetically similar banana plants, vegetative propagation clones plants.
5. **A** – BB X bb.
Black fur dominant over white; all offspring black means homozygous.
6. **B** – (iii) Y-chromosome only.
7. **A** – Both Assertion and Reason true, Reason explains Assertion.
8. **Purpose:** To remove wastes from blood as urine. **(1 mark)**
Organs: *Urinary bladder* stores urine **(0.5 mark)**
urethra releases it. **(0.5 mark)**
9. **No, (0.5 mark)**
the plant will not remain healthy because vaseline blocks stomata, preventing gas exchange. **(1.5 marks)**
10. (a) Pituitary gland
(b) Pancreas
(c) Adrenal gland
(d) Testes **(award 0.5 mark for each correct answers)**
11. (a) Biosphere / environment **(award 0.5 mark for each correct answers)**
(b) Trophic level
(c) Climate
(d) Consumers
12. Three pathways of glucose breakdown:
 - Aerobic respiration (with oxygen) produces CO₂, water, energy. **(1 mark)**
 - Anaerobic respiration (without oxygen) produces lactic acid and less energy. **(1 mark)**

- Fermentation in yeast produces ethanol and CO₂. **(1 mark)**

13. Example food web from given organisms:

- Grass → Rabbit → Fox → Tiger

- Trees → insects → frog → Snake → Peacock *(or any two possible correct food chain award one mark for each)*

Construction of Food web – 1 mark

14. Difference: Pollination is transfer of pollen; fertilisation is fusion of male and female gametes. **(2 marks)**

Fertilisation site: Ovule **(0.5 mark)**

product: zygote. **(0.5 mark)**

Diagram: Pistil showing pollen tube entering ovule. **(2 marks)**

OR

Diagram Human female reproductive system diagram labeled: **(3 marks)**

(a) Ovary (egg production)

(b) Fallopian tube (fertilisation)

(c) Uterus (implantation)

(d) Vagina/ Cervix (entry of sperms) *(award 0.5 mark for each correct answers)*

15. (a) Genetic factor: Sex chromosomes in unisexual plants **(1 mark)**

(b) Epigenetic condition: Temperature-dependent sex determination in reptiles **(1 mark)**

(c) Male parent determines sex due to presence of Y chromosome. **(2 marks)**

Section B: Chemistry

16. A – KMnO₄ is an oxidising agent, it oxidises FeSO₄. **(1 mark)**

17. D – Helium or nitrogen. **(1 mark)**

18. B – 2:1 (hydrogen to oxygen). **(1 mark)**

19. D – weak acid and strong base. **(1 mark)**

20. B – Tartaric acid. **(1 mark)**

21. B- Correct color in dilute hydrochloric acid: Red **(1 mark)**

Correct color in aqueous sodium hydroxide: Yellow

22. C – Aluminium. **(1 mark)**

23. D – A is false but R is true (1 mark)

24. (a) Compound X: Iron(III) oxide (0.5 mark)

(b) Reaction type: Redox reaction (0.5 mark)

(c) Reaction equation: $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow 2\text{Fe} + \text{Al}_2\text{O}_3$ (1 mark)

25. Option A or B:

A.

- Cannot store in water (reacts violently) (1 mark)

- Element 'X': Sodium (0.5 mark)

- Extraction by electrolysis of molten sodium chloride. (0.5 mark)

Equation: $2\text{NaCl} \rightarrow 2\text{Na} + \text{Cl}_2$ (1 mark)

OR

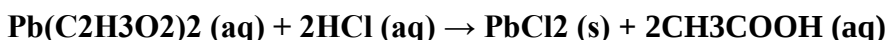
B.

- Ore A produces CO_2 (carbonate); calcination converts to oxide. (1.5 MARKS)

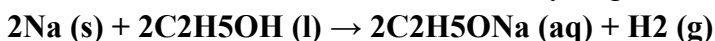
- Ore B produces SO_2 (sulfide); roasting converts to oxide. (1.5 MARKS)

26. Reactions: (award 1 mark for each correct answers and deduct 0.5 marks from each if physical state of substances is not mentioned)

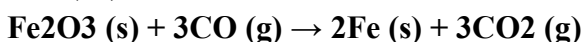
(i) Lead acetate + $\text{HCl} \rightarrow$ Lead chloride + acetic acid



(ii) Sodium + ethanol $\rightarrow$ Sodium ethoxide + hydrogen



(iii) Iron(III) oxide + $\text{CO} \rightarrow$ Iron + CO_2



27. Compound X with 2 carbon atoms: **Acetic acid (CH_3COOH)** (0.5 marks for name or formula and award 1.5 marks for structure)

pH nature: *Weak acid compared to mineral acid.* (1 mark)

Esterification reaction with alcohol forms sweet smelling esters. (1 mark)



Salt produced: Sodium acetate (CH_3COONa) (1 mark)

(i) **Saturated hydrocarbons:** contain only **single bonds**, e.g., Ethane (C_2H_6) (2 marks)

Unsaturated hydrocarbons: contain **double or triple bonds**, e.g., Ethene (C_2H_4)

(ii) Unsaturated hydrocarbon $\rightarrow$ saturated hydrocarbon by **hydrogenation** (adding H_2 using **Ni/Pt catalyst**)

Used in **vegetable oil industry.** (2 marks)

(iii) Hydrocarbon with double bond and 4 carbons: **Butene (C_4H_8).** (1 mark)

28. (award 1 mark for each correct answers)

(a) Carbon and oxygen form covalent bond.

- (b) Calcium and oxygen form ionic bond.
- (c) CaO conducts electricity when molten; CO₂ does not.
- (d) CaO is solid; CO₂ is gas.

Section C: Physics

- 29. C** – The shape of the resistor is changed. **(1 mark)**
- 30. B** – Both A and R are true, and R is not the correct explanation of A. **(1 mark)**
- 31. C** – Same at all points (magnetic field strength inside solenoid). **(1 mark)**
- 32. B** – Use of fuse. **(1 mark)**
- 33. C** – If magnetic field lines are parallel and equidistant, they represent zero field strength (incorrect statement). **(1 mark)**
- 34. Defect: Hypermetropia (Farsightedness)** **(0.5 mark)**
 Explanation: The student finds it hard to see nearby objects (textbook) but can clearly see distant objects (blackboard). In hypermetropia, the eyeball is too short or the lens is less curved, so light focuses behind the retina when viewing close objects.
 Causes: Short eyeball length or Less curvature of lens **(1 mark)**
 Correction: Use convex (converging) lenses. Convex lenses help converge light rays early to focus on the retina for close objects.. **(0.5 mark)**
- 35. Magnetic field at X is stronger than at Y because field lines are closer at X. (1 mark)**
 Diagram shows direction of field lines from North to South. **(2 marks)**
- 36. Absolute refractive index of diamond = relative refractive index × absolute refractive index of glass = $1.6 \times 1.5 = 2.4$. (award 1 mark of correct formula and 2 mark for correct calculation)**
- 37. Ray diagrams for concave lens: (award 1 mark for each correct answers)**
 (a) Object at focus: image at infinity (highly diminished).
 (b) Object between focus and twice focal length: image virtual and diminished.
 (c) Object beyond twice focal length: image virtual and diminished.
- 38. Joule's heating effect:** Electrical energy converted to heat in resistor. **(1 mark)**
 Applications: electric heaters, fuses, toasters, incandescent bulbs. **(0.5 mark for each valid applications)**

OR

Numerical:

- Power (P) = 81 W in 100 Ω resistor
 Current (I) = $\sqrt{P/R} = \sqrt{81/100} = 0.9$ A **(1 mark)**
 Voltage across 25 Ω resistor (V₂) = $I \times R = 0.9 \times 25 = 22.5$ V **(1 mark)**
 Total resistance = $100 + 25 + 25 = 150$ Ω
 Voltage across whole circuit (V₁) = $I \times \text{total resistance} = 0.9 \times 150 = 135$ V **(1 mark)**
- 39. (a) Phenomenon: Dispersion of light. (1 mark)**
 (b) Seven colors occur due to different wavelengths refracting differently. **(1 mark)**
 (c) Recombination shown by second prism combining spectrum into white light or rainbow formation explained with ray diagram. **(2 marks)**