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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: $Fe_2O_3 + 2Al \rightarrow 2Fe + Al_2O_3$ **(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: $2NaCl \rightarrow 2Na + Cl_2$ **(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 + HCl → Lead chloride + acetic acid
$Pb(C_2H_3O_2)_2$ (aq) + 2HCl (aq) → $PbCl_2$ (s) + 2CH_3COOH (aq)

(ii) Sodium + ethanol → Sodium ethoxide + hydrogen
2Na (s) + 2C_2H_5OH (l) → 2C_2H_5ONa (aq) + H_2 (g)

(iii) Iron(III) oxide + CO → Iron + CO_2
Fe_2O_3 (s) + 3CO (g) → 2Fe (s) + 3CO_2 (g)

27. Compound X with 2 carbon atoms: ***Acetic acid (CH3COOH*) (0.5 marksfor 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)**

2CH_3COOH (aq) + Na_2CO_3 (s) → 2CH_3COONa (aq) + H_2O (l) + CO_2 (g)

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 → 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; CO_2 does not.
(d) CaO is solid; CO_2 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) lensesConvex 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 × 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 × R = 0.9 × 25 = 22.5 V **(1 mark)**
Total resistance = 100 + 25 + 25 = 150 Ω
Voltage across whole circuit (V1) = I × total resistance = 0.9 × 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)**