KENDRIYA VIDYALAYA SANGATHAN
PATNA REGION

PRE BOARD-2 (2025-26)
SET-1

Max. Marks: 80 **CLASS – X**
SUB- SCIENCE **Time: 3 hours**

General Instructions:

(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

	Section – A (Biology)	**Marks**
1	Select the correct option from the following statements about the functioning of the human heart. A. Right atrium receives deoxygenated blood from different parts of the body and sends it to pulmonary veins. B. Left atrium sends oxygenated blood to right ventricle which pumps it to different parts of the body. C. Right atrium receives deoxygenated blood from the body and sends it to the right ventricle. D. Left atrium receives oxygenated blood from the pulmonary arteries and sends it to the left ventricle.	1
2	Secretion of less saliva in mouth will effect the conversion of : A. proteins into amino acids C. fats into fatty acids and glycerol B. starch into simple sugars D. sugars into alcohol	1
3	Which of the following is a correct combination of function and part of the brain? A. Posture and balance: Cerebrum C. Salivation: Medulla in midbrain B. Hunger: Pons in hindbrain D. Blood pressure: Medulla in hindbrain	1
4	A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose? A. Regeneration B. Budding C. Vegetative propagation D. Sexual reproduction	1
5	In a cross between black furred rabbit (B) and white furred rabbit (b), all offspring were found to have black fur. What can be inferred about the genetic makeup of the parent rabbits? **A.** BB X bb B. Bb X Bb C. Bb X bb D. bb X bb	1

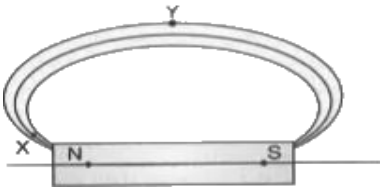
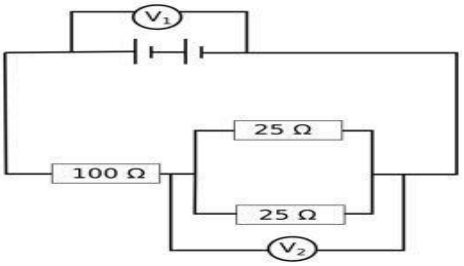
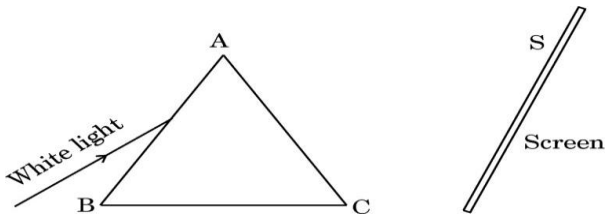
6	In human males all the chromosomes are paired perfectly except one. This/these unpaired chromosome is/are (i) large chromosome (ii) small chromosome (iii) Y-chromosome (iv) X-chromosome (a) (i) and (ii) (b) (iii) only (c) (iii) and (iv) (d) (ii) and (iv)	1
7	**Assertion (A):** Tallness of a pea plant is controlled by an enzyme**.** **Reason (R):** The gene for that enzyme makes proteins which help the plant to be tall. A. Both A and R are true, and R is the correct explanation of A. B. Both A and R are true, and R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true.	1
8	What is the purpose of making urine in the human body? Name the organs that stores and releases the urine.	2
9	Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? Give reasons for your answer.	2
10	Answer the following : (a) Name the endocrine gland associated with brain? (b) Which gland secretes digestive enzymes as well as hormones? (c) Name the endocrine gland associated with kidneys? (d) Which endocrine gland is present in males but not in females?	0.5 x 4 =2
11	Suggest one word for each of the following statements/ definitions:- (a) The physical and biological world where we live in (b) Each level of food chain where transfer of energy takes place (c) The physical factors like temperature, rainfall, wind and soil of an ecosystem. (d) Organisms which depend on the producers either directly or indirectly for food	0.5 x 4 =2
12	During exercise, Gyanendra experienced pain in her calf muscles. His teacher explained that this happens due to variation in the pathway of glucose breakdown. Describe the three possible pathways of glucose breakdown under different conditions in living organisms.	3
13	About 100 acres of forest land was declared as Natural reserve park. The following organisms were predominant in the Natural reserve park: rabbit, frog, grass, fish, fox, water insects, zebra, peacock, snake, trees, bird, owl, insects, tiger, vulture, duck. Create a food web comprising two separate food chains with different producers by using the above data.	3

14	Distinguish between pollination and fertilization. Mention the site and product of fertilisation in a flower. Draw a neat, labelled diagram of a pistil showing pollen tube growth and its entry into the ovule. **OR** Draw a well labelled diagram of the human female reproductive system and label the parts responsible for the following functions: (a) Production of egg (b) Site of fertilisation (c) Site of implantation (d) Entry of the sperms	2+0.5+0.5+2= 5 3+0.5x4=5
15	"*Sex determination is an important developmental event in the life cycle of all sexually reproducing plants. Recent studies of sex determination in many plant species, from ferns to maize, have been fruitful in identifying the diversity of genetic and epigenetic factors that are involved in determining the sex of the flower or individual*." The above is an excerpt from an article by two scientists, Cristina Juarez and Jo Ann Banks. (a) What is the most likely genetic factor for sex determination in unisexual plants? (b) Epigenetic factors refer to factors external to the genetic component of an individual. Name evidence of ONE epigenetic condition that determines sexuality in animals. (C) Which parent determines the sex of the offspring in human beings? Why?	1+1+2=4
	SECTION B (Chemistry)	
16.	A dilute ferrous sulphate solution was gradually added to the beaker containing acidified permanganate solution. The light purple colour of the solution fades and finally disappears. Which of the following is the correct explanation for the observation? (a) KMnO4 is an oxidising agent, it oxidises FeSO4 (b) FeSO4 acts as an oxidising agent and oxidises KMnO4 (c) The colour disappears due to dilution; no reaction is involved (d) KMnO4 is an unstable compound and decomposes in presence of FeSO4 to a colourless compound.	1
17	Which of the following gases can be used for storage of fresh sample of an oil for a long time? (a) Carbon dioxide or oxygen (b) Nitrogen or oxygen (c) Carbon dioxide or helium (d) Helium or nitrogen	1
18	Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is (a) 1:1 (b) 2:1 (c) 4:1 (d) 1:2	1
19	Sodium carbonate is a basic salt because it is a salt of (a) strong acid and strong base (b) weak acid and weak base (c) strong acid and weak base (d) weak acid and strong base	1
20	One of the constituents of baking powder is sodium hydrogencarbonate, the other constituent is (a) hydrochloric acid (b) tartaric acid (c) acetic acid (d) sulphuric acid	1

21	Methyl orange is added to dilute hydrochloric acid and to aqueous sodium hydroxide. What is the colour of the methyl orange in each solution? **Sample** / **colour in dilute hydrochloric acid** / **colour in aqueous sodium hydroxide** A / Orange / Red B / Red / Yellow C / Red / Orange D / Yellow / Red	1
22	Although metals form basic oxides, which of the following metals form an amphoteric oxide? (a) Na (b) Ca (c) Al (d) Cu	1
23	**Assertion (A):** C_4H_8, C_4H_6 and C_4H_{10} are members of the same homologous series **Reason (R):** C_4H_8, C_4H_6, C_3H_4, C_3H_6, C_2H_4, C_2H_2 are unsaturated hydrocarbons. A. Both A and R are true, and R is the correct explanation of A. B. Both A and R are true, and R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true.	1
24	Compound X and aluminium are used to join railway tracks. (a) Identify the compound X (b) Name the reaction (c) Write down its reaction.	0.5+0.5+1=2
25	***Attempt either option A or B.*** **A**. An element 'X' is stored in kerosene, and cannot be extracted from its ore using a reducing agent. 'X' forms an ionic compound on reaction with chlorine. (i) Can we store 'X' in water? Give reason to support your answer. (ii) Identify element 'X'. Name the process used and write the equation for extraction of 'X' from its ore. **OR** **B.** Two ores A and B were taken. On heating ore A gives CO2 whereas, ore B gives SO2 . What steps will you take to convert them into metals?	3
26	Write a balanced chemical equation for each of the following reactions and also classify them. (a) Lead acetate solution is treated with dilute hydrochloric acid to form lead chloride and acetic acid solution. (b) A piece of sodium metal is added to absolute ethanol to form sodium ethoxide and hydrogen gas. (c) Iron (III) oxide on heating with carbon monoxide gas reacts to form solid iron and liberates carbon dioxide gas.	3
27	(i) A compound 'X' having two carbon atoms in its molecule turns blue litmus red and 5 – 8% solution of 'X' in water is widely used as a preservative. Identify the compound 'X' and write its structure. (ii) Compare its pH nature with a mineral acid. (iii) 'X' on reacting with alcohols produces sweet smelling compounds, used in making perfumes. Name the reaction and write its chemical equation. (iv) When sodium carbonate is added to 'X', a colorless gas is	2+1+1+1=5

	produced which turns lime water milky. Write the chemical equation for the reaction giving the name of the salt produced. **OR** (i) Differentiate between saturated and unsaturated hydrocarbons by giving one example each, with a structural formula. (ii) Write the method of converting an unsaturated hydrocarbon into a saturated hydrocarbon. Name the industry where this reaction is commonly used. iii. Write the name and structure of a hydrocarbon having double bond and four carbon atoms in its one molecule.	2+2+1=5
28	Oxygen can combine with both metals and non-metals. It combines with Calcium to form CaO and with carbon to form CO_2. (a) What type of bond is formed between carbon and oxygen? (b) Identify the type of bond formed between Calcium and oxygen. (c) Which of the above compounds will be a good conductor of electricity in molten state and why? (d) Comment on the physical state (solid, liquid or gas) of CaO and CO_2.	1 x 4 =4

	Section – C (Physics)	
29	The resistivity does not change if (a) the material is changed (b) the temperature is changed (c) the shape of the resistor is changed (d) both material and temperature are changed	1
30	**Assertion (A):** The resistance of a conductor increases as its length increases. **Reason (R):** Resistance of a conductor is inversely proportional to its cross-sectional area. A. Both A and R are true, and R is the correct explanation of A. B. Both A and R are true, and R is not the correct explanation of A. C. A is true but R is false. D. A is false but R is true.	1
31	The strength of magnetic field inside a long current carrying straight solenoid is (a) more at the ends than at the centre (b) minimum in the middle (c) same at all points (d) found to increase from one end to the other	1
32	The most important safety method used for protecting home appliances from short circuiting or overloading is (a) earthing (b) use of fuse (c) use of stabilizers (d) use of electric meter	1
33	Choose the incorrect statement from the following regarding magnetic lines of field (a) The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points (b) Magnetic field lines are closed curves (c) If magnetic field lines are parallel and equidistant, they represent zero field strength (d) Relative strength of magnetic field is shown by the degree of closeness of the field lines	1
	A student has difficulty in reading his textbooks but can read the blackboard	

34	clearly while sitting in the last row. Name the defect of vision the student is suffering from. List two reasons due to which this defect arises. Write the nature of the lenses required to correct this defect.	2
35	Magnetic field lines are shown in the given diagram. A student makes a statement that the magnetic field at X is stronger than at Y. (i) Explain with reason if the student's claim is correct. (ii) Also redraw the diagram and mark the direction of magnetic field lines. 	3
36	Refractive index of diamond with respect to glass is 1.6 and absolute refractive index of glass is 1.5. Find out the absolute refractive index of diamond.	3
37	Draw ray diagrams showing the image formation by a concave lens when an object is placed (a) at the focus of the lens (b) between focus and twice the focal length of the lens (c) beyond twice the focal length of the lens	3
38	What is Joule's heating effect? How can it be demonstrated experimentally? List its four applications in daily life. **OR**  The arrangement of resistors shown in the above figure is connected to a battery.; The power dissipation in the 100 Ω resistor is 81 W. Calculate (i) the current in the circuit (ii) the reading in the voltmeter V_2 the reading in the voltmeter V_1	5
39	A person allowed a narrow beam of white light from the sun to enter a dark room through a small aperture and placed a glass prism in its path in such a manner that the beam falls on the face AB of the prism as shown in the figure.  A screen S is placed on the other side of the prism, facing AC. On turning the prism slowly, a beautiful band of colors is obtained on the screen. It is the spectrum of sunlight. (a) Name the phenomenon due to which a prism splits the incident white light into a band of colours. (b) state the reason of getting a band of seven colors in the above case. (c) (i) Explain with the help of a labelled ray diagram, an experimental arrangement to show the recombination of the spectrum of white light. **OR** (C) (ii) Draw a labelled ray diagram to show the formation of a rainbow.	4