

केन्द्रीय विद्यालय संगठन, कोलकाता संभाग  
KENDRIYA VIDYALAYA SANGATHAN, KOLKATA REGION  
द्वितीय प्री-बोर्ड परीक्षा / SECOND PRE-BOARD EXAMINATION, 2025-26

कक्षा / CLASS – X  
विषय/SUB. – SCIENCE (086)

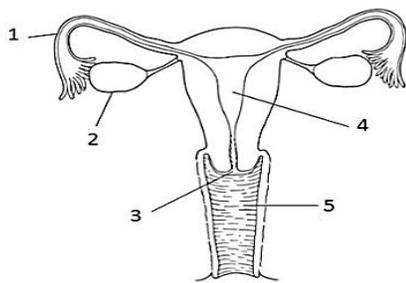
अधिकतम अंक /MAX. MARKS-80  
समय/TIME – 03 घंटे/Hours

**General instructions:**

- The question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry, Section C is Physics.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of the questions.

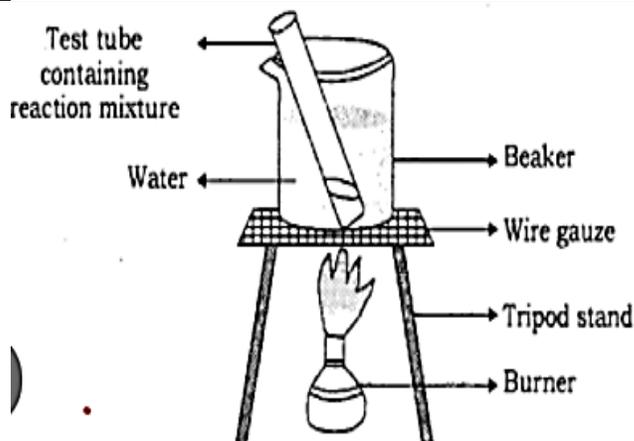
Q.No.	SECTION A (BIOLOGY)	MARK																				
Q.1	<p>Among the given substance, which are selectively reabsorbed in the kidney tubule from the initial filtrate?</p> <p>(a) Glucose, amino acid, salts and major amount of water (b) Urea, glucose, salt, water (c) Glucose, urea, salt, amino acid and less amount of water (d) Urea, water and salt.</p>	1																				
Q.2	<p>Walking in a straight line and riding a bicycle are the activities which are possible due to a part of brain. Choose the correct location and part of the brain,</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Part of the brain</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Fore-brain</td> <td>cerebrum</td> </tr> <tr> <td>(b)</td> <td>Mid –brain</td> <td>hypothalamus</td> </tr> <tr> <td>(c)</td> <td>Hind- brain</td> <td>Cerebellum</td> </tr> <tr> <td>(d)</td> <td>Hind- brain</td> <td>Medulla</td> </tr> </tbody> </table>		Part of the brain	Name	(a)	Fore-brain	cerebrum	(b)	Mid –brain	hypothalamus	(c)	Hind- brain	Cerebellum	(d)	Hind- brain	Medulla	1					
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Q.3	<p>Study the graph given below that represents the amount of energy supplied with respect to the time while an athlete is running at full speed.</p> <div style="text-align: center;"> </div> <p>Choose the correct combination of plots and justification provided in the following table</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>PLOT A</th> <th>PLOT B</th> <th>JUSTIFICATION</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Aerobic</td> <td>Anaerobic</td> <td>Amount of energy is low and inconsistent in aerobic and high in anaerobic</td> </tr> <tr> <td>(b)</td> <td>Aerobic</td> <td>Anaerobic</td> <td>Amount of energy is high and consistent in aerobic and low in anaerobic</td> </tr> <tr> <td>(c)</td> <td>Anaerobic</td> <td>Aerobic</td> <td>Amount of energy is high and consistent in aerobic and low in anaerobic</td> </tr> <tr> <td>(d)</td> <td>Anaerobic</td> <td>Aerobic</td> <td>Amount of energy is high and inconsistent in anaerobic and low in aerobic</td> </tr> </tbody> </table>		PLOT A	PLOT B	JUSTIFICATION	(a)	Aerobic	Anaerobic	Amount of energy is low and inconsistent in aerobic and high in anaerobic	(b)	Aerobic	Anaerobic	Amount of energy is high and consistent in aerobic and low in anaerobic	(c)	Anaerobic	Aerobic	Amount of energy is high and consistent in aerobic and low in anaerobic	(d)	Anaerobic	Aerobic	Amount of energy is high and inconsistent in anaerobic and low in aerobic	1
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Q.4	Raj and Kareena are a couple trying to conceive a child. They want to have a baby girl. Which of the following factor will determine the sex of their baby: (a) The blood type of Raj and Kareena (b) The length of time between egg release and fertilization in Kareena (c) The presence of <b>Y chromosome</b> in Raj's sperm (d) The presence of <b>X chromosome</b> in Raj's sperm	1
	<b>Questions 5, 6, consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</b> (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true but R is false. (d) A is false but R is true.	
Q.5	Assertion (A) Plants are grown through vegetative propagated, even though they bear seeds ,for various reasons. Reason (R): Potato, apple and grapes are grown through tuber, stem cutting , grafting or other vegetative methods of propagation	1
Q.6	Assertion(A) : When homozygous Purple coloured flower was crossed with flower having white colour , all flowers of F <sub>1</sub> generation were purple. Reason(R) : The gene for white colour did not pass from parental generation to offspring in F <sub>1</sub> as purple was dominant.	1
Q.7	In an unisexual flower, method of pollination is (a) Self pollination only (b) cross pollination only (c) both self and cross pollination (d) if filament of stamen is long then cross pollination and if short then self pol	1
Q.8	Construct a food chain comprising of snake, grass, grasshopper and frog which organism will have highest concentration of non bio degradable pesticide? (a) Grass (b) Snake (c) grasshopper (d) frog	1
Q.9	A lot of biodegradable waste is generated in your neighborhood. Write two negative impacts it may have on the environment and human health. OR What are decomposers? Write any two effects if they are removed from the ecosystem.	2
Q.10	(i)Name the group of compounds responsible for the depletion of the ozone layer. Where is it used? (ii)Give reason why ozone layer is formed in the outermost layer of the atmosphere.	2
Q.11	(i)Explain the step of photosynthesis in green plant (ii) Write the photosynthetic equation.	3
Q.12	Write the enzyme(s) and from where it is secreted in process of digestion of: (a) Starch (b) Protein (c) fat OR Write the structural similarities and functional difference between villi and alveoli found in human body.	3

Q.13	<p>A green stem tomato plant denoted by (GG) is crossed with a tomato plant with purple stem denoted by (gg).</p> <p>(a) What colour stem would you expect in their F<sub>1</sub> generation?</p> <p>(b) With the help of a cross depict the colour of stem of F<sub>2</sub> progeny if progeny of F<sub>1</sub> generation are self pollinated.</p> <p>(c) Write both the phenotypic and genotypic ratio of F<sub>2</sub> generation.</p>	3
Q.14	<p>The diagram shows the reproductive system of a human female.</p>  <p>(a) Write the name of the part labeled 1-5</p> <p>(b) Write name of the part where fertilization and implantation take place</p> <p>(c) What is placenta? Write its role during development of the fetus.</p> <p style="text-align: center;">OR</p> <p>(a) Identify and name the type of asexual reproduction in <i>Amoeba</i> and <i>Hydra</i>.</p> <p>(b) What is the main difference between budding and vegetative propagation?</p> <p>(c) How does asexual reproduction ensure faster multiplication of organisms?</p> <p>(d) Why is there no variation seen in these offspring?</p> <p>(e) Which mode would be most advantageous for rapid crop improvement?</p>	5
Q.15	<p style="text-align: center;">(CASE-BASED)</p> <p>While returning home at night, Aryan suddenly hears a loud barking dog running towards him aggressively. Instantly, his heartbeat increases, breathing becomes faster, and his body becomes alert, enabling him to run quickly. After a few minutes, when the situation becomes normal, his body gradually returns to a relaxed state.</p>  <p>Answer the following questions:</p> <p>(a) Name the hormone responsible for Aryan's sudden alertness and immediate reaction. What is this hormone commonly called?</p> <p>(b) Which gland secretes this hormone? How is this gland different from exocrine gland</p> <p>(c) How does this hormone prepare the body to face emergency situations? (Give any two changes.)</p>	4

## SECTION –B (CHEMISTRY)

Q.16	<p>Which of the following equation represent redox reaction and what are the values of “p” and “q” in the equations</p> <p>Equation 1- <math>\text{Fe}_2\text{O}_3(\text{s}) + 2\text{Al}(\text{s}) \rightarrow \text{Al}_2\text{O}_3(\text{s}) + p\text{Fe}(\text{l}) + \text{heat}</math></p> <p>Equation 2- <math>2\text{C}_4\text{H}_{10}(\text{g}) + 13\text{O}_2 \rightarrow 8\text{CO}_2(\text{g}) + q\text{H}_2\text{O}(\text{g})</math></p> <p>(a) Only equation 1 is redox reaction, p=1 and q= 3  (b) Only equation 2 is redox reaction, p=12 and q= 10  (c) Both equation 1 and 2 are redox reaction, p=2 and q= 4  (d) Both equation 1 and 2 are redox reaction, p=2 and q= 10</p>	1
Q.17	<p>Galvanization is a method of protecting iron from rusting by coating with a thin layer of:</p> <p>(a) Gallium (b) Aluminium (c) Zinc (d) Calcium</p>	1
Q.18	<p>Consider the following hydro carbon and indicate which of them will undergo addition reaction and which will undergo substitution reaction</p> <p>(I) <math>\text{C}_5\text{H}_{10}</math> (II) <math>\text{C}_3\text{H}_8</math> (III) <math>\text{C}_4\text{H}_6</math> (IV) <math>\text{C}_{10}\text{H}_{22}</math></p> <p>(a) (i), (iii), (iv)- addition and (ii)- substitution  (b) (i), (iii)- addition and (ii), (iv)- substitution  (c) (i), (iii)- substitution and (ii), (iv)- addition  (d) All will undergo addition reaction only</p>	1
Q.19	<p>During the electrolytic refining of copper, the anode, the cathode and the electrolyte used respectively are.</p> <p>(a) pure copper, impure copper, dilute sulphuric acid  (b) pure copper, impure copper, acidified copper sulphate solution  (c) Impure copper, impure copper, acidified copper sulphate solution  (d) Impure copper, pure copper, acidified copper sulphate solution</p>	1
Q.20	<p><b>Assertion (A):</b> Hydrogen gas is not evolved when a metal reacts with nitric acid.  <b>Reason (R):</b> Nitric acid is a strong oxidizing agent.</p> <p>Choose the correct option</p> <p>(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)  (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)  (c) Assertion (A) is true but reason (R) is false.  (d) Assertion (A) is false but reason (R) is true.</p>	1
Q.21	<p>An organic compound A of molecular formula <math>\text{C}_2\text{H}_4</math> on reduction gives another compound B of molecular formula <math>\text{C}_2\text{H}_6</math>. B on reduction with chlorine in the presence of sunlight give C of molecular formula <math>\text{C}_2\text{H}_5\text{Cl}</math>. The compound A, B, C are</p> <p>(a) A= ethane, B=ethene, C= chloroethane  (b) A=ethene, B=ethane, C= chloroethane  (c) A=ethyne, B=ethane, C= chloroethane  (d) A=ethene, B=ethyne, C= chloroethane</p>	1
Q.22	<p>Ravi was helping his father renovate their house when he noticed a worker mixing a white powder with water to repair wall cracks. Curious Ravi asked what the powder was, and the worker explained that it was; plaster of Paris( POP),</p> <p>(a) How is plaster of Paris obtained from gypsum?</p>	2

	<p>(b) Write the chemical equation for the reaction.</p> <p style="text-align: center;">OR</p> <p>(a) Write the chemical formula and chemical name of bleaching powder .</p> <p>(b) Mention two use of bleaching powder</p>	
Q.23.	<p>Give scientific reason for:</p> <p>(a) We must use a <b>toothpaste</b> for brushing our teeth before going to bed.</p> <p>(b) Acid must be added to water for diluting it but not <i>vice-versa</i></p>	2
Q.24.	<p>A colorless solution of potassium iodide (KI) is mixed with solution containing lead nitrate (<math>\text{Pb}(\text{NO}_3)_2</math>). A reaction occurs and a brightly coloured precipitate is formed.</p> <p>(a) Identify the type of reaction and define it</p> <p>(b) Write the balanced chemical equation for the reaction.</p> <p>(c) What is the colour and chemical formula of the precipitate formed?</p>	3
Q.25	<p>Explain the following terms with reference to extraction of metals from its ore.</p> <p>(a) Roasting</p> <p>(b) Calcination</p> <p>(c) Anode mud.</p>	3
Q.26	<div style="text-align: center;">  </div> <p>The test tube contains a mixture of 1mL of "X" and 1 mL of "Y". A few drops of "Z" are added in the test tube. Y and Z turn blue litmus to Red and Y is used for making vinegar. When the mixture is heated slowly in the water bath, after 5 minutes, a sweet smelling compound "K" is formed.</p> <p>(i) Identify X,Y,Z and K</p> <p>(ii) Name the reaction and explain it</p> <p>(iii) Write a balanced equation of the above reaction.</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">OR</p> <p>(i) What are soaps? Describe a soap molecule.</p> <p>(ii) What are micelles? Draw structure of micelles.</p> <p>(iii) Explain the cleansing action of soap.</p> <p>(iv) What is saponification reaction?</p>	5

(CASE BASED)

q.27



4

Frothing in the Yamuna is a complex environmental issue caused by a combination of factors, primarily the high concentration of pollutants from untreated sewage and industrial discharge, especially surfactants like phosphates from detergents. These chemicals reduce the water's surface tension, causing bubbles to form and persist as foam when agitated by barrages or fast flow. The problem is exacerbated by low river flow in winter, which decreases natural dilution.

(A) Predict the pH of the water of river Yamuna

- (i) 3-5            (ii) 5-7            (iii) 7            (iv) 10-11

(B) Give reason for your answer for the above question(A)

(C) If water from the above Yamuna river is given to you to neutralize it, which chemical would you choose and why?

SECTION –C (PHYSICS)

Q.28

Which of the two lenses with power -3D and 4D respectively can form a real image?

- (a) Only lens with power -3D            (b) Only lens with power 4D  
(c) both the lenses            (d) neither of the lenses.

1

Q.29.

Column I represent the phenomenon and column II represent the reason behind this phenomenon

	Column I	Column II
(i)	Twinkling of stars	Dispersion of light
(ii)	Blue colour of the sky	Scattering of light
(iii)	The raised position of stars	Atmospheric refraction
(iv)	Advanced sunset and delayed sunrise	Dispersion of light

Which of the pairs are correctly matched?

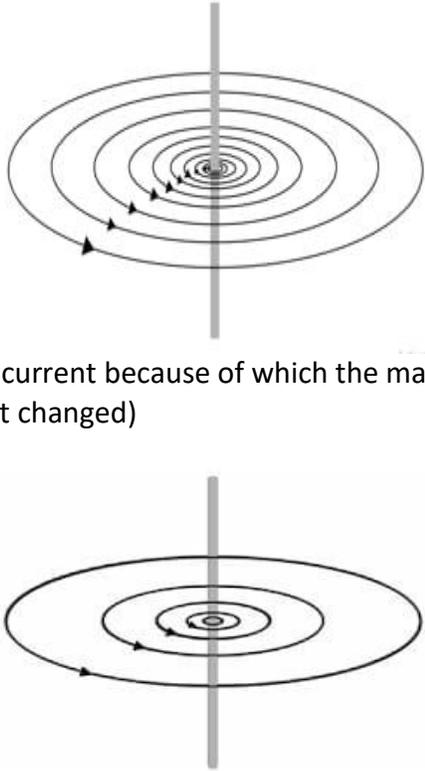
- (a) (i) and (ii)            (b) (ii) and (iv)  
(c) (ii) and (iv)            (d) (ii) and (iii)

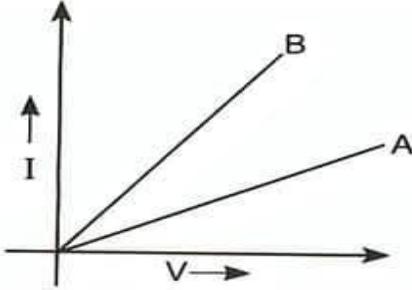
1

**Questions no. 30 and 31 consist of two statements – Assertion (A) and Reason (R).**

**Answer these questions selecting the appropriate option given below:**

- (a) Both A and R are true and R is the correct explanation of A.  
(b) Both A and R are true but R is not the correct explanation of A.  
(c) A is true but R is false.            (d) A is false but R is true.

Q.30	<p>Assertion : Red colour light bends the least while passing through a glass prism . Reason : The speed of red colour light is least in the glass as compared to other coloured light</p>	1
Q.31	<p>Assertion : Magnetic field lines never intersect each other. Reason : At the point of intersection, the magnetic field would have to point in two different direction at the same time which is physically impossible</p>	1
Q.32.	<p>An electric iron of resistance <math>20\Omega</math> draws a current of 5 A. The heat developed in the iron in 30 s is (a) 3000 J (b) 1500 J (c) 15000 J (d) 6000 J</p>	1
Q.33.	<p>The diagram below shows magnetic field line due to a current in a straight conductor</p>  <p>Something was done to the current because of which the magnetic field lines changed as shown below.( direction not changed)</p> <p>What was done to the current: (a) Its magnitude was increased and direction reversed. (b) Its magnitude was decreased and direction reversed (c) Its magnitude was decreased but direction not changed (d) Its magnitude was increased and direction reversed</p>	1
Q.34	<p>A student is asked to obtain an erect image of candle using the mirror used by dentists to view the tooth. Draw a ray diagram of the image formation.</p>	2

Q,35	 <p>Two V-I graph A and B for series and parallel combination of two resistors are as shown in the above graph. Giving reason state which graph shows (a) Series and (b) parallel combination of resistors.</p>	2
36	<p>(i) Two lenses have a power of (a) +2D (b) -4D. What is the focal length and nature of each lens?</p> <p>(ii) An object is kept at a distance of 100 cm from each of the above lens. Calculate (i) Image distance (ii) magnification in each of the two lens.</p>	3
37.	<p>(a) State Ohm's law and write its mathematical expression.</p> <p>(b) Write the difference between resistance and resistivity.</p>	3
38	<p>(a) What is a solenoid ?</p> <p>(b) Draw the magnetic field lines around a solenoid?</p> <p>(c) Why the magnetic field inside a solenoid is uniform and strong</p> <p>(d) How can the strength of magnetic field of a solenoid increased?</p> <p style="text-align: center;">OR</p> <p>(a) Describe the pattern of magnetic field line when current flows through a circular loop</p> <p>(b) Draw a neat and labeled diagram to show the pattern of magnetic field line in a circular loop carrying current.</p> <p>(c) Name and explain the rule used to determine the direction of magnetic field line.</p> <p>(d) Write the factors on which the strength of magnetic field in the above case depend on.</p>	5
<b>CASE- BASED</b>		
Q.39.	<p>One day Sipun and Tanuj went to the sea beach. Suddenly they notice a ship anchored far from the shore. Sipun excitedly exclaimed – “What a beautiful blue flag waving from top of the ship”. Tanuj tried looking hard and said-“No Sipun , I cant see the flag clearly”. Just then another of their friend Arka also joined them. Tanuj asked him if he is able to see the flag. Arka was also able to see the flag clearly. Clearly Tanuj was suffering from some defect of the eye.</p> <p>(a) Identify the eye defect.</p> <p>(b) Explain the above defect of the eye.</p> <p>(c) Draw a ray diagram showing the defect and its correction.</p>	4

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