

**BANGALORE SAHODAYA QUESTION PAPER (2022-23)**

Science (Code – 086)

CLASS X –SET 2

Maximum Marks: 80

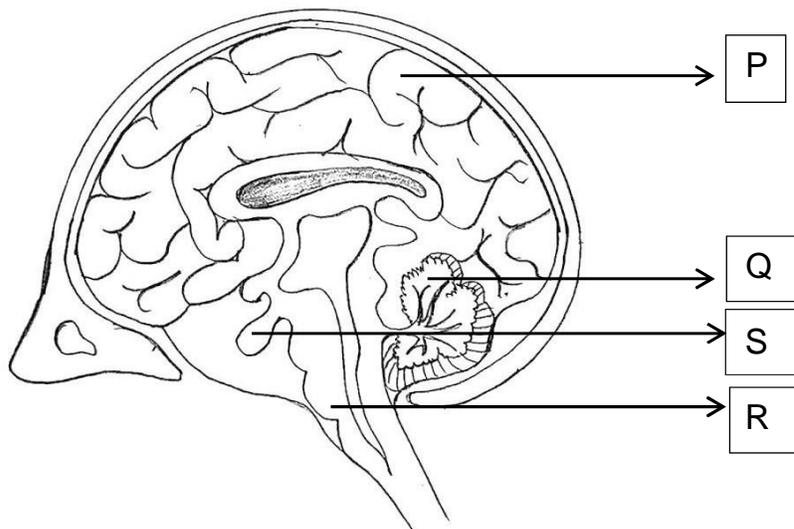
Time allowed: 3 Hrs

Date :

	<b>General Instructions:</b> i. This question paper consists of 39 questions in 5 sections. 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. iii. Section A consists of 20 objective type questions carrying 1 mark each. iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words. v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words. vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.	
	<b>SECTION - A</b>	
	<b>Select and write one most appropriate option out of the four options given for each of the questions 1 – 20</b>	
<b>Q.No</b>	<b>Questions</b>	<b>Marks</b>
1.	A glass rod dipped in ammonia when brought closer to the mouth of the test tube containing hydrochloric acid, it forms dense white fumes of ammonium chloride . It is a a) combination reaction , acidic salt is formed b) combination reaction , basic salt is formed c) combination reaction , neutral salt is formed d) neutralization reaction, acidic salt is formed.	1
2.	Which of the following reactants are used in thermit reaction, needed to repair broken railway track ? a. $\text{Al}_2\text{O}_3 + \text{Fe}$ b. $\text{MnO}_2 + \text{Al}$ c. $\text{Fe}_2\text{O}_3 + \text{Al}$ d. $\text{Cu}_2\text{O} + \text{Fe}$	1

3.	<p>3.The chemical formulae for slaked lime, quick lime and marble are</p> <p>a) CaO, CaCO<sub>3</sub>, Ca(OH)<sub>2</sub></p> <p>b) Ca(OH)<sub>2</sub>, CaO, CaCO<sub>3</sub></p> <p>c) CaCO<sub>3</sub>, CaO, Ca(OH)<sub>2</sub></p> <p>d) Ca(OH)<sub>2</sub>, CaO, Ca(HCO<sub>3</sub>)<sub>2</sub></p>	1
4.	<p>Soaps and detergents are _____ of long chain carboxylic acids / fatty acids respectively</p> <p>i) Sodium and sulphonate salts</p> <p>ii) Sodium and potassium salts</p> <p>iii) Sodium and ammonium salts</p> <p>iv) Sodium and magnesium salts</p> <p>(a) i and ii            (b) i and iii            (c) ii and iv            (d) iii and iv</p>	1
5.	<p>The heating of ferrous sulphate crystals is a chemical change when</p> <p>a) pale green to white colour change is observed</p> <p>b) Water droplets observed on the walls of the test tube.</p> <p>c) White colour salt with pungent smelling gases is observed.</p> <p>d) Brown coloured compound with pungent smelling gases observed.</p>	1
6.	<p>Equal volumes of hydrochloric acid and sodium hydroxide solutions of same concentration are mixed and the pH of the resulting solution is checked with a pH paper . What would be the colour obtained ?</p> <p>a) Red</p> <p>b) orange</p> <p>c) green</p> <p>d) purple</p>	1
7.	<p>The equations given below are all examples of redox reactions. In which of the equations is the underlined compound being oxidized?</p> <p>a) <u>CO</u><sub>2</sub> + C -----&gt; 2CO</p> <p>b) <u>FeO</u> + Mg -----&gt; Fe + MgO</p> <p>c) <u>3CO</u> + Fe<sub>2</sub>O<sub>3</sub> -----&gt; 2Fe + 3CO<sub>2</sub></p> <p>d) <u>CuO</u> + H<sub>2</sub> -----&gt; Cu + H<sub>2</sub>O</p>	1

8.



Observe the given diagram and identify the mismatched combination/combinations

i.	P	Cerebrum	Thinking and reasoning
ii.	Q	Cerebellum	Thinking and reasoning
iii.	R	Cerebellum	Muscular coordination
iv.	S	Pituitary	Controls growth

- a. i and iii
- b. ii and iii
- c. i and iv
- d. ii and iv

1

9.

Out of the following test tubes which one will give blue black colour on addition of iodine solution-

- a. Test tube 1 containing sugarcane juice, saliva and a few drops of acid
- b. Test tube 2 containing corn flour, saliva and a few milliliters of water
- c. Test tube 3 containing sugar cane juice, saliva and a few drops of caustic soda
- d. Test tube containing corn flour, saliva and a few drops of acid

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10.

Identify the function of nephrons in a healthy person

- a. Breaks down harmful chemicals
- b. eliminates all salts
- c. reabsorbs all glucose
- d. reabsorbs all water

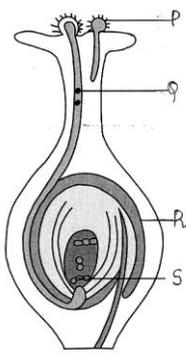
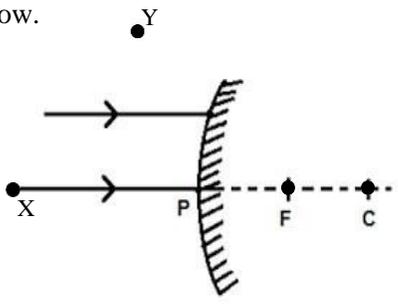
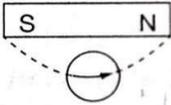
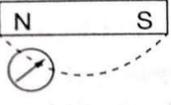
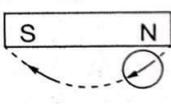
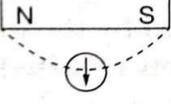
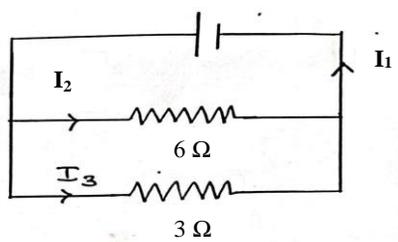
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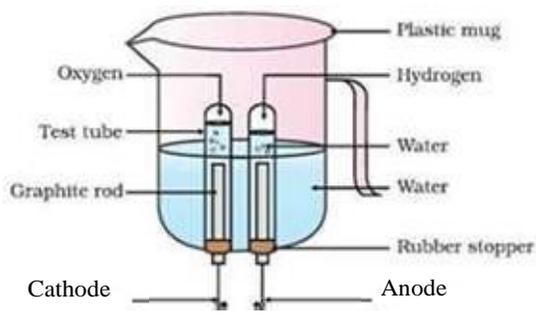
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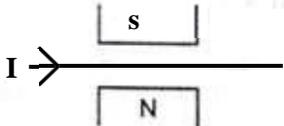
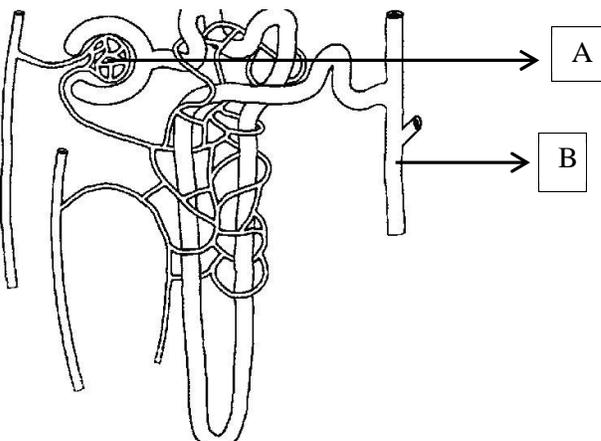
In a plant the number of chromosomes present in the male gamete is twenty four. Which of the following statements is true?

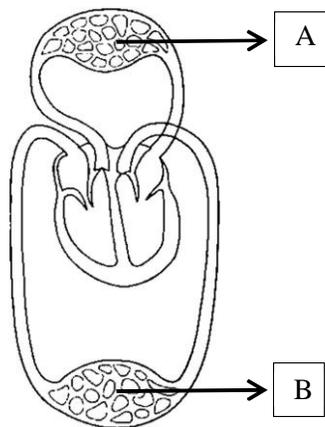
- a. the egg cell and ovary has 48 chromosomes
- b. the egg cell has 24 chromosomes

1

	<p>c. The anther and ovule have 24 chromosomes</p> <p>d. The cells of petals and sepals have 24 chromosomes</p>	
12.	<p>Which of the following is the male gamete?</p> <p>a. P</p> <p>b. Q</p> <p>c. R</p> <p>d. S</p> 	1
13.	<p>The ratio of the focal lengths of two lenses <math>L_1</math> and <math>L_2</math> is 1:4. The ratio of their powers <math>P_1:P_2</math> is</p> <p>(a) 1:4      (b) 4:1      (c) 1:2      (d) 2:1</p>	1
14.	<p>A light ray is incident on a convex mirror as shown below.</p> <p>Through which point will the ray travel after reflecting from the mirror?</p> <p>a) X    b) F    c) Y    d) C</p> 	1
15.	<p>A magnetic compass is placed near a bar magnet as shown below. Which of the following figure depicts the correct direction of the compass needle?</p> <p>a.     b. </p> <p>c.     d. </p>	1
16.	<p>Which of the following options depict the correct relation between <math>I_1</math>, <math>I_2</math>, and <math>I_3</math> in the circuit shown below?</p> <p>a) <math>I_1 &lt; I_2</math> and <math>I_2 &gt; I_3</math></p> <p>b) <math>I_1 &gt; I_2</math> and <math>I_2 &gt; I_3</math></p> <p>c) <math>I_1 &gt; I_3</math> and <math>I_3 &lt; I_2</math></p> <p>d) <math>I_1 &gt; I_3</math> and <math>I_3 &gt; I_2</math></p> 	1
<p><b>Q. no 17 to 20 are Assertion - Reasoning based questions.</b></p> <p><b>These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</b></p> <p><b>(a) Both A and R are true and R is the correct explanation of A</b></p>		

	<p>(b) Both A and R are true and R is not the correct explanation of A</p> <p>(c) A is true but R is false</p> <p>(d) A is False but R is true</p>	
17.	<p>Assertion: In a neutralization reaction acid reacts with base to form salt and water.</p> <p>Reasoning: It is an exothermic reaction.</p>	1
18.	<p>Assertion : Rings of cartilage are present in the trachea</p> <p>Reason : Lungs always contain a residual volume of air</p>	1
19.	<p>Assertion : Men have either X or Y chromosome as the sex chromosomes.</p> <p>Reason : Men have a mismatched pair of sex chromosome.</p>	1
20.	<p>Assertion : A 50W bulb glows brighter than a 25W bulb when both are connected in parallel to a potential difference of 220V.</p> <p>Reason : The current through a 50W bulb is greater than 25W bulb in a parallel combination.</p>	1
<p><b>SECTION – B</b></p> <p><b>Q. no. 21 to 26 are very short answer questions</b></p>		
21.	<p>Answer the questions based on the diagram</p>  <p>(a) Rectify the error in the given diagram.</p> <p>(b) How do you test for the gases evolved in the above experiment?</p> <p style="text-align: center;"><b>OR</b></p> <p>Translate the following statements into balanced chemical equations.</p> <p>a) Solutions of sodium sulphate and Barium chloride reacts to form white precipitate of barium sulphate and solution of sodium chloride.</p> <p>b) Silver chloride on photolytic decomposition gives silver and chlorine.</p>	2
22.	<p>Differentiate between central nervous system and peripheral nervous system based on-</p> <p>a. their components</p> <p>b. their function</p>	2
23.	<p>a. What are receptors? Name the receptor for smell.</p> <p>b. How is efficient communication of information ensured between cells in a multicellular organism?</p>	2

24.	<p>a. What leads to the opening and closing of stomatal pore?</p> <p>b. Name the organelle that is present in guard cells but absent in other epidermal cell. What is the function of this organelle?</p>	2
25.	<p>Draw the pattern of magnetic field lines in a current carrying straight conductor. Mention the factors on which the strength of the magnetic field depends?</p> <p style="text-align: center;"><b>OR</b></p> <p>A current carrying wire is placed in the plane of the paper in a magnetic field as shown below. In which direction does the wire move? State the rule used to determine the direction of the movement of the wire.</p> <div style="text-align: center;">  </div>	2
26.	<p>a. There are generally lesser number of individuals at higher trophic levels compared to the previous levels. Give reason.</p> <p>b. Ozone that shields earth's surface from harmful UV radiations is formed in presence of UV radiations. Justify.</p>	2
<p><b>SECTION – C</b></p> <p><b>Q.no. 27 to 33 are short answer questions</b></p>		
27.	<p>a) The melting point of calcium oxide is 2850 K whereas melting point of magnesium chloride is 981 K. Give reason.</p> <p>b) Show the formation of calcium oxide by electron dot structure.</p>	3
28.	<p>Compound 'X' is used for bleaching cotton in the textile industry.</p> <p>a) Write the chemical name and formula of 'X'.</p> <p>b) Write the equation for the formation of 'X'.</p> <p>c) Write one more use of 'X'.</p> <p>d) What is the role 'X' in chemical industry?</p>	3
29.	<p>Observe the given diagram and answer the question that follow:</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>a. Identify A. What is its function?</p> <p>b. Why is the above structure coiled?</p> <p>c. What is the composition of the fluid present in B?</p> </div> </div>	3



- Identify A. How does its structure help in its function?
- How does B help in the formation of lymph?
- What is the advantage of this type of circulation?

30. (a) Name the three wires used in house hold electrical circuits.  
 (b) Write their colour codes.  
 (c) Which of the three wires is at a higher potential?

3

31. a) Draw the ray diagram showing the image formation in a concave mirror when the object is placed between C and F.  
 b) An object 5 cm high is placed at a distance of 10cm from a convex mirror of radius of curvature 30cm. Find the nature and position of the image.

3

**OR**

- a) The following table gives the value of the refractive indices of some media.

Medium	Benzene	Kerosene	Alcohol	Turpentine Oil
Refractive index	1.50	1.44	1.36	1.47

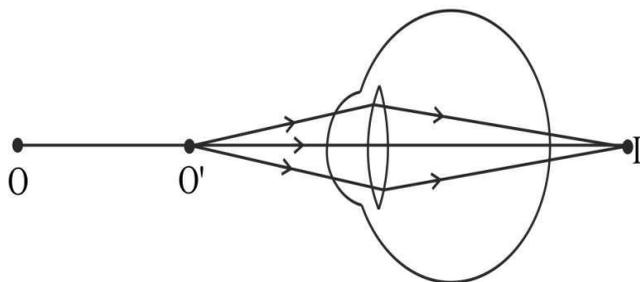
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Light passes through these media one by one. Arrange these in the increasing order of the speed of light through them.

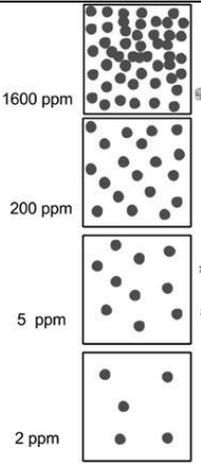
- b) The speed of light in water is  $2.25 \times 10^8$  m/s. If the speed of light in glass is  $2 \times 10^8$  m/s, calculate the refractive index of water with respect to glass. Also find the absolute refractive index of glass. ( speed of light in vacuum =  $3 \times 10^8$  m/s)

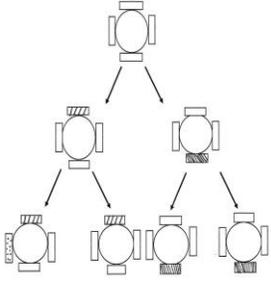
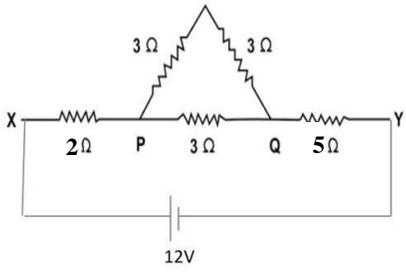
32. a) Identify the defect shown in the diagram below.

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- b) List the causes of the above defect.  
 c) Draw the diagram showing the correction.

33.	 <p>*ppm stands for parts per million</p> <p>The above figure shows the concentration of a particular molecule as we move up the food chain.</p> <ol style="list-style-type: none"> <li>Name the process depicted in the picture.</li> <li>How do such molecules enter into the food chain? How can we stop this?</li> <li>Why does the concentration of this molecule increase up the food chain?</li> </ol>	3
<p><b>SECTION – D</b></p> <p><b>Q.no. 34 to 36 are Long answer questions</b></p>		
34.	<p>X and Y are the second members of homologous series of alcohol and carboxylic acid respectively.</p> <ol style="list-style-type: none"> <li>Draw the structural formula of 'X' and 'Y'.</li> <li>'X' and 'Y' react in the presence of conc. sulphuric acid to form a pleasant smelling compound.             <ol style="list-style-type: none"> <li>Write the balanced chemical equation for it.</li> <li>What is the role of concentrated sulphuric acid in the above reaction ?</li> <li>Write the IUPAC name of the compound formed.</li> </ol> </li> <li>What important precaution must be taken while carrying out the above experiment ? Why?</li> <li>Write one use of 'Y' .</li> </ol> <p style="text-align: center;"><b>OR</b></p> <p><math>C_2H_5O-</math> is the incomplete formula to which an atom of hydrogen can be</p> <ol style="list-style-type: none"> <li>Added to obtain compound 'A' .</li> <li>Removed to obtain compound 'B'</li> </ol> <ol style="list-style-type: none"> <li>Write the structural formula for the compound 'A' and 'B'</li> <li>Write the IUPAC names for the compound 'A' and 'B'</li> <li>Identify the functional groups of compound 'A' and 'B'</li> <li>With conditions write the equation for the oxidation of compound 'A' in the presence of an oxidizing agent.</li> <li>Give two uses of compound 'A' .</li> </ol>	5

35.	 <p>a. Identify the mode of reproduction represented in the above picture. Name an organism that reproduces in the above method.</p> <p>b. Write on advantage and one disadvantage of the above mode of reproduction.</p> <p>c. Organisms in the second and third row are similar but subtly different from each other. Give reason.</p> <p>d. Are these differences beneficial for the species? Justify your answer.</p> <p style="text-align: center;"><b>OR</b></p> <p>a. Where does fertilization and implantation take place in the female reproductive system?</p> <p>b. List the changes that take place in the uterus-</p> <ol style="list-style-type: none"> <li>i. After fertilization</li> <li>ii. if fertilization does not take place</li> </ol> <p>c. Write two disadvantages of Copper –T .</p> <p>d. Government is debating on increasing the marriageable age of girls to 21 years. What could be the reason for this?</p>	5
36.	<p>Give reasons.</p> <p>(a) Tungsten is used as a filament in a bulb.</p> <p>(b) Ammeter is connected in series in an electric circuit.</p> <p>(c) For the circuit given, Calculate: (i) total resistance (ii) total current (iii) power developed across <math>2\Omega</math> resistor</p> 	5
<p><b>SECTION - E</b></p> <p><b>Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts.</b></p> <p><b>Internal choice is provided in one of these sub-parts.</b></p>		
37.	<p>Sulphur is a yellow amorphous solid. It exists as rhombic , monoclinic and plastic forms . When it reacts with nitric acid, it gets oxidized to sulphuric acid . When sulphur is taken in a spatula and heated , it immediately melts due to its low melting point. Sulfur when burnt in air forms sulfur dioxide . When a piece of magnesium is ignited and dropped into the jar containing Sulphur dioxide, magnesium oxide and sulphur are produced .</p> <ol style="list-style-type: none"> <li>1. What is the role of Sulphur dioxide and nitric acid in the given situation?</li> <li>2. Write the equation for the reaction of Sulphur dioxide with magnesium.</li> <li>3. How will you experimentally determine the nature of sulphur di-oxide?</li> </ol>	4

	<p style="text-align: center;"><b>OR</b></p> <p>How will you experimentally determine the nature of Magnesium oxide?</p>	
38.	<p>Anthocyanin is a pigment responsible for the purple colour in flowers of pea plants. They found that a gene ‘A’ encodes for a protein that controls synthesis of anthocyanin and hence produces purple flowers. An allele ‘a’ codes for a non-efficient protein which interrupts anthocyanin production. Hence produces white flowers.</p> <p>a. Where are genes located in a pea plant?</p> <p>b. Identify the dominant and the recessive trait and justify based on the above information.</p> <p>c. If a plant having genotype ‘Aa’ is crossed with a plant having genotype ‘aa’. What will be the phenotypic ratio of the progeny?</p> <p style="text-align: center;"><b>OR</b></p> <p>c. If a plant having genotype ‘AA’ is crossed with a plant having genotype ‘Aa’. What will be the phenotype/s and genotype/s of the progeny?</p>	4
39.	<p style="text-align: center;"><b>The changing colours of a chameleon</b></p> <p>The changing colours of a chameleon’s skin is mostly due to special pigment-containing cells in its skin. Some of the colours is due to an effect similar to what causes the daytime sky to be blue.</p> <p>Here is a schematic picture of a chameleon’s skin.</p> <p>Under the layer of yellow pigmented cells is a layer of cells that contain tiny particles, much smaller than any of the wavelengths in visible light. When light having a mixture of colours strikes these cells, the blue part of the light is spread over a wide range of directions, while the red part is hardly scattered at all and mostly continues in its original direction.</p> <p>(a) Name the phenomena causing the daytime sky to be blue.</p> <p>(b) Why does the sky appear black to an astronaut in space?</p> <p>(c) When a beam of visible light strikes the cells, why is the blue part of visible light spread over a wide range of directions .</p> <p style="text-align: center;"><b>OR</b></p> <p>Why are “danger” signal lights red in colour?</p>	4

