 <b>MACRO</b> VISION ACADEMY BURHANPUR	<b>Entrance Paper (2024-25)</b>		<b>For Office Use Only</b>
	<b>Class:</b>	XI BIOLOGY (SAMPLE PAPER-II)	
	<b>Time:</b>	02:30 Hrs.	
	<b>M.M:</b>	75	

### Personal Information

**Student's Name:-** \_\_\_\_\_ **Father's Name:-** \_\_\_\_\_

**City:-** \_\_\_\_\_ **Mobile No:-** \_\_\_\_\_ **Exam Date:-** / / 2024

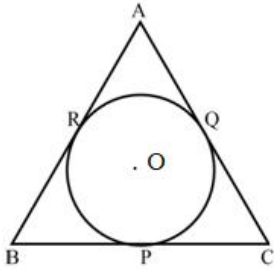
**Studying in Class:-** \_\_\_\_\_ **Appearing for class:-** \_\_\_\_\_ **Board:-** \_\_\_\_\_

#### GENERAL INSTRUCTIONS:

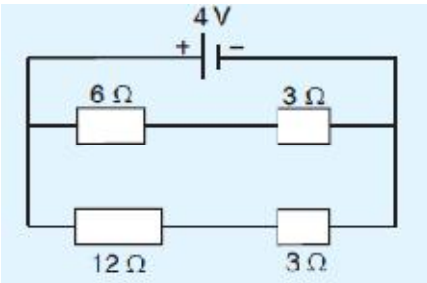
- All questions are compulsory.
- Section A contains 10 questions (from 1-10) of Mathematics.
- Section B contains 15 questions (from 11-25) of Physics.
- Section C contains 15 questions (from 26-40) of Chemistry.
- Section D contains 25 questions (from 41-65) of Biology.
- Section E contains 10 questions (from 66-75) of English.

Mathematics (10)	Physics (15)	Chemistry (15)	Biology (25)	English (10)	OBTAINED MARKS (75)

<b>Section-A</b>		
<b>Mathematics</b>		
Q.N	Questions	Answers
1.	A tree 6 m tall cast a 4 m long shadow. At the same time, a flag pole cast a shadow 50 m long. How long is the flag pole?	75 m
2.	The radii of two cylinders are in the ratio 2:3 and their heights are in the ratio 5:3, then the ratio of their volumes are _____	20:27
3.	If $\sec \alpha = \frac{5}{4}$ , evaluate $\frac{1 - \tan \alpha}{1 + \tan \alpha}$ .	$\frac{1}{7}$
4.	Which of the term of AP 5, 2, -1, ..... is -49?	19 <sup>th</sup> term
5.	If the distance between the points A(4, p) and B(1, 0) is 5 units then what are the values of p?	$p = \pm 4$

6.	<p>A student is trying to find the roots of <math>3x^2 - 10x - 8 = 0</math> by splitting the middle term as follow :</p> <p>Step 1 : <math>3x^2 - 10x - 8 = 0</math></p> <p>Step 2 : <math>3x^2 - mx + nx - 8 = 0</math></p> <p>What could be the value of 'm' and 'n' ?</p> <p>(a) m=12 and n=2                      (b) m=-12 and n=-2</p> <p>(c) m=8 and n=2                        (d) m=-8 and n=-2</p>	(a) m=12 and n=2
7.	<p><b>Assertion (A):</b> A cubical die is rolled. The probability of getting a composite number is <math>\frac{1}{3}</math></p> <p><b>Reason (R):</b> In a throw of a cubical die, the probability of getting a prime number is <math>\frac{2}{3}</math>.</p> <p>(a) Both assertion and reason are correct and reason is correct explanation of the assertion.</p> <p>(b) Both assertion and reason are correct, but the reason is not the correct explanation of the assertion.</p> <p>(c) Assertion is correct, but reason is incorrect.</p> <p>(d) Assertion is incorrect, but reason is correct.</p>	(c) Assertion is correct, but reason is incorrect.
<p><b>Case study (Q.8 – Q.10)</b></p> <p><b>Based on the given information, answer the following questions.</b></p> <p>Raghav has been selected by his school to design logo for sports day T-shirts for students and The logo design is as given in the figure and he is working on the fronts and different colours according the theme. In the given figure, a circle with centre O is inscribed in a <math>\triangle ABC</math>, such that it touches the sides AB , BC and CA at points R, P and Q respectively. The length of side AB, BC and CA are 12 cm, 8 cm and 10 cm.</p> <div style="text-align: center;">  </div>		
8.	The length of AR is	7 cm
9.	If radius of the circle is 4 cm, then area of triangle OAB is	$24 \text{ cm}^2$
10.	The length of BP is	5 cm

**Section-B**  
**Physics**

11.	An object 5 cm high is placed at a distance of 10 cm from a convex mirror of radius of curvature 30 cm. Find the size of the image.	3 cm
12.	Name the phenomenon due to which a swimming pool appears less deep than it really is.	Refraction of light or refraction
13.	A ray of light passes from a medium X to another medium Y. No refraction of light occurs if the ray of light hits the boundary of medium Y at an angle of :	$90^\circ$
14.	Light enters from air into a glass plate having refractive index 1.50. What is the speed of light in glass ? (The speed of light in vacuum is $3 \times 10^8$ m s <sup>-1</sup> ).	$2 \times 10^8$ m s <sup>-1</sup> (or $2 \times 10^8$ m/s)
15.	A stream of positively charged particles (alpha particles) moving towards west is deflected towards north by a magnetic field. The direction of magnetic field is	upward or out of the page
16.	The far point of a myopic person is 80 cm in front of the eye. What is the power of the lens required to correct the defect ?	1.25 D
17.	Which is refracted most by a prism : red light or violet light ?	Violet light
18.	Name the phenomenon which causes the twinkling of stars.	Atmospheric refraction
19.	How much energy is given to each coulomb of charge passing through a 6 V battery ?	6 Joule or 6 J
20.	An electric bulb draws a current of 0.25 A for 20 minutes. Calculate the amount of electric charge that flows through the circuit.	300 C
21.	For the circuit shown in the diagram below:  <p>What is the value of potential difference across 12Ω resistor ?</p>	3.2 V

22.	<p><b>Assertion (A):</b> Refractive index has no units.</p> <p><b>Reason (R):</b> The refractive index is a ratio of two similar quantities.</p> <p>(a) Both assertion and reason are correct and reason is correct explanation of the assertion.</p> <p>(b) Both assertion and reason are correct, but the reason is not the correct explanation of the assertion.</p> <p>(c) Assertion is correct, but reason is incorrect.</p> <p>(d) Assertion is incorrect, but reason is correct.</p>	(a) Both assertion and reason are correct and reason is correct explanation of the assertion.
<p><b>Case study (Q.23 – Q.25)</b></p> <p><b>Based on the given information, answer the following questions.</b></p> <p>The spherical mirror forms different types of images when the object is placed at different locations. When the image is formed on screen, the image is real and when the image does not form on screen, the image is virtual. When the two reflected rays meet actually, the image is real and when they appear to meet, the image is virtual.</p> <p>A concave mirror always forms a real and inverted image for different positions of the object. But if the object is placed between the focus and pole the image formed is virtual and erect.</p> <p>A convex mirror always forms a virtual, erect and diminished image. A concave mirror is used as doctor's head mirror to focus light on body parts like eyes, ears, nose etc., to be examined because it can form erect and magnified image of the object. The convex mirror is used as a rear view mirrors in automobiles because it can form an small and erect image of an object.</p>		
23.	Which type of mirror is used by dentist?	Concave mirror
24.	Where the object is placed in front of concave mirror to produce virtual and enlarged image?	Between pole and focus <b>OR</b> Between P and F
25.	Which type of mirror is used in vehicle for rear view?	Convex mirror
<p><b>Section-C</b></p> <p><b>Chemistry</b></p>		
<p><b>Case study (Q.26 – Q.28)</b></p> <p><b>Based on the given information, answer the following questions.</b></p> <p>When fats and oils are oxidized, they become rancid and their smell and taste change. Usually substances which prevent oxidation (antioxidants) are added to foods containing fats and oil. Keeping food in air tight containers helps to slow down oxidation.</p>		
26.	Name the process which results in the change in taste of food items.	Oxidation of fats and oils / Rancidity
27.	Which factor is responsible for slowing down the process of rancidity using refrigerator?	Low temperature

28.	Which gas can be used to prevent rancidity specially in packed food items?	Nitrogen										
29.	Write the chemical formula of blue vitriol.	$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$										
30.	From amongst the following chemical species: (a) ${}_{18}^{39}\text{Ar}$ (b) ${}_{19}^{40}\text{K}^+$ (c) ${}_{20}^{41}\text{Ca}^{++}$ (d) ${}_{20}^{42}\text{Ca}^+$ Write species those have identical electronic configurations.	(c) ${}_{20}^{41}\text{Ca}^{++}$ and (d) ${}_{20}^{42}\text{Ca}^+$										
31.	An acid reacts with a substance Z with the liberation of $\text{CO}_2$ gas. What will be the nature of Z?	Metal carbonates / metal bicarbonates										
32.	Fill in the missing data in the following table <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Name of the salt</th> <th rowspan="2">Formula</th> <th colspan="2">Salt obtained from</th> </tr> <tr> <th>Acid</th> <th>Base</th> </tr> </thead> <tbody> <tr> <td>Ammonium chloride</td> <td><math>\text{NH}_4\text{Cl}</math></td> <td>HCl</td> <td>-</td> </tr> </tbody> </table>	Name of the salt	Formula	Salt obtained from		Acid	Base	Ammonium chloride	$\text{NH}_4\text{Cl}$	HCl	-	Base $\text{NH}_4\text{OH}$
Name of the salt	Formula			Salt obtained from								
		Acid	Base									
Ammonium chloride	$\text{NH}_4\text{Cl}$	HCl	-									
33.	Name a metal which: (a) is the best conductor of heat. (b) has a very low melting point.	silver. Gallium										
34.	<b>Assertion (A):</b> The large number of carbon compounds exist due to the self-linking property of carbon known as catenation. <b>Reason (R):</b> The strength of the carbon to carbon bonds is very high. (a) Both assertion and reason are correct and reason is correct explanation of the assertion. (b) Both assertion and reason are correct, but the reason is not the correct explanation of the assertion. (c) Assertion is correct, but reason is incorrect. (d) Assertion is incorrect, but reason is correct.	(a) Both assertion and reason are correct and reason is correct explanation of the assertion.										
35.	<b>Assertion (A):</b> Denaturation of ethyl alcohol makes it unfit for drinking purposes. <b>Reason (R):</b> Denaturation of ethyl alcohol is carried by methyl alcohol. (a) Both assertion and reason are correct and reason is correct explanation of the assertion. (b) Both assertion and reason are correct, but the	(a) Both assertion and reason are correct and reason is correct explanation of the assertion.										

	reason is not the correct explanation of the assertion. (c) Assertion is correct, but reason is incorrect. (d) Assertion is incorrect, but reason is correct.	
36.	A metal 'X' combines with a non-metal 'Y' by the transfer of electrons to form a compound Z. (i) Will this compound dissolve in kerosene or petrol? (ii) Will this compound be a good conductor of electricity in the solid state?	(i) insoluble (ii) does not conduct electricity in the solid state.
37.	Complete the following reaction and name the main product formed. $CH_3CH_2OH + 2[O] \xrightarrow[K_2Cr_2O_7]{Acidified}$	CH <sub>3</sub> COOH
38.	Give the names of the following functional groups: (i) -OH           (ii) -COOH	(i) Alcohol (ii) Carboxylic acid
39.	ZnCO <sub>3</sub> is heated in the absence of oxygen to form _____.	ZnO
40.	Complete and balance the following chemical equations: (i) Al <sub>2</sub> O <sub>3</sub> + HCl → (ii) K <sub>2</sub> O + H <sub>2</sub> O →	(i) Al <sub>2</sub> O <sub>3</sub> + 6HCl → 2AlCl <sub>3</sub> + 3H <sub>2</sub> O (ii) K <sub>2</sub> O + H <sub>2</sub> O → 2KOH

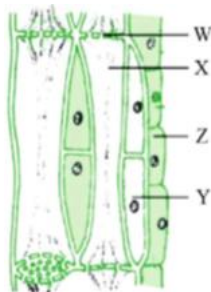
**Section-D**

**Biology**

**Case study (Q.41 – Q.43)**

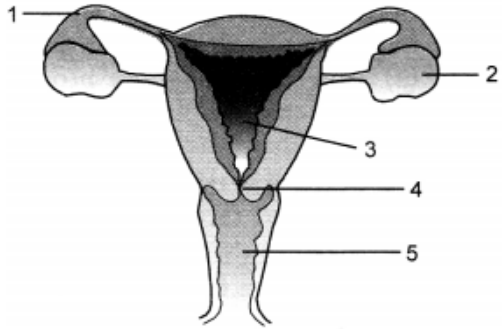
**Based on the given information, answer the following questions.**

The food which is prepared by the process of photosynthesis in the leaves of a plant has to be transported to other parts like stem, roots, branches etc. Therefore this food is transported to other parts of the plant through a kind of tubes called phloem. The transport of food from leaves to other parts of a plant is called translocation. The food made by the leaves is in the form of simple sugar. Phloem is present in all the parts of a plant. Phloem is a long tube made of many living cells joined end to end. The living cells of phloem are called sieve tubes.

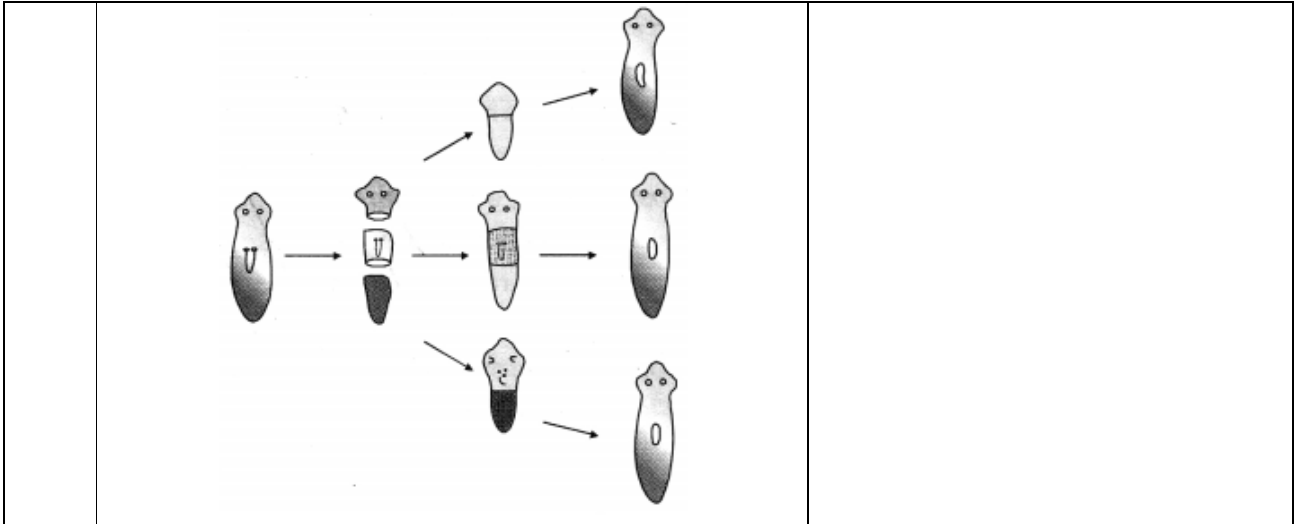


41.	Name the labelled part 'X' which contains cytoplasm but no nucleus.	Sieve tubes
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42.	Write the function of labeled part 'Z'	Lateral conduction of food
43.	Name dead component of phloem.	Phloem fibre / sclerenchyma
44.	<p><b>Assertion (A):</b> In an ecosystem, the function of producers is to convert organic compounds into inorganic compounds.</p> <p><b>Reason (R):</b> Green plants, the producers, transduce solar energy.</p> <p>(a) Both assertion and reason are correct and reason is correct explanation of the assertion.</p> <p>(b) Both assertion and reason are correct, but the reason is not the correct explanation of the assertion.</p> <p>(c) Assertion is correct, but reason is incorrect.</p> <p>(d) Assertion is incorrect, but reason is correct.</p>	(d) Assertion is incorrect, but reason is correct.
45.	<p><b>Assertion (A):</b> Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled.</p> <p><b>Reason (R):</b> Cellular DNA is the information source for making proteins in the cell.</p> <p>(a) Both assertion and reason are correct and reason is correct explanation of the assertion.</p> <p>(b) Both assertion and reason are correct, but the reason is not the correct explanation of the assertion.</p> <p>(c) Assertion is correct, but reason is incorrect.</p> <p>(d) Assertion is incorrect, but reason is correct.</p>	(a) Both assertion and reason are correct and reason is correct explanation of the assertion.
	<b>Give one word for:</b>	
46.	Pigment present in plant, which convert solar energy into chemical energy	Chlorophyll
47.	Blueprint responsible for making all basic body designs.	DNA
48.	The process through which fertilized mammalian egg (embryo) get embedded into the inner thick wall of the uterus.	Implantation
49.	Name the part of brain responsible of maintaining heart beat	Medulla
50.	The process in which harmful chemical substance like pesticide get accumulated in the body of organism at different tropic levels of food chain	Bio magnification

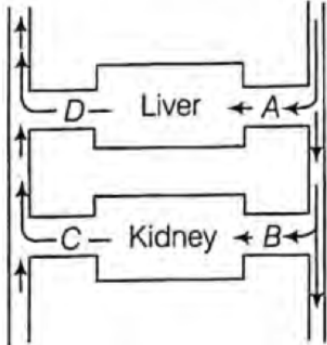
<b>Fill in the blank.</b>		
51.	The biochemical reaction depends on light is _____	Photosynthesis
52.	According to modern concept, Mendel factor is called as _____.	Genes
53.	Spinal cord is enclosed in a bony cage called _____.	Vertebral column
54.	The response of plant roots towards water is called _____.	Hydrotropism
55.	Herbivores always occupy the _____ trophic level of food chains.	Second
<b>Answer the following questions.</b>		
56.	The leaves of a plant first prepare food 'A' by photosynthesis. Food A then gets converted into food 'B' What are A and B?	A- Glucose B- Starch
57.	Give the scientific terms used to represent Growth of a pollen tube towards ovule.	Chemotropism
58.	From the following list find out the organism, which is likely to have maximum concentration of pesticide in its body: grass, grass- hopper, frog, snake and hawk.	Hawk
59.	Which of the two "sperm or egg" decides the sex of the child?	Sperm
60.	Which gas is formed, when fossil fuels are burnt in insufficient air?	Carbon monoxide
61.	Identify the part from the diagram given below, in which ovulation occur.  	2
62.	Diagram given below depicts certain method of asexual reproduction in organism. Mention any one organism, which can also reproduce by this method of asexual reproduction.	Hydra





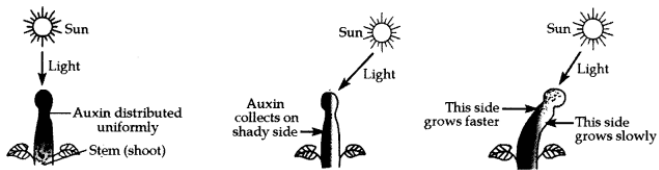
63. The diagram given below represents the liver, kidney and some associated blood vessels. Identify the vessel from the labeled parts A-D in which the blood will contain the lowest concentration of urea.

B



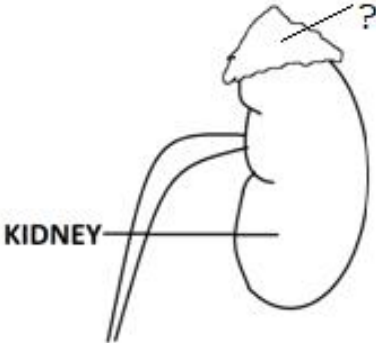
64. Which type of movement in plant is depicted by given figure?

Phototropic



65. Identify the structure in the figure given below:

Adrenal gland



**Section-E****English****Read the following passage carefully and answer the following questions.**

Quite recently India laid the foundation stone for one of its most sought-after projects – running a Bullet Train. It was very well considered as a dream project of the Honourable Prime Minister, Narendra Modi. Entire India felt proud of having its first ever bullet train scheduled to run between Mumbai and Ahmedabad, a distance of 508 km, in about 2 hours 35 minutes. In his own words, “To grow, one needs to expand one’s dreams and decide one’s strength to achieve that. It’s the New India which has to fly high”. “Bullet Train is a project that will provide pace to development. Along with new technology, it will also bring results faster”, he added. According to AchalKhare, the Managing Director of the National High Speed Rail Corporation, the project would be completed by December 2023.

It all began with the Prime Minister’s ambitious dream of having a high-speed train in India that cuts the travel time and yet remains an economical option to go from one city to another. The technology of this High-Speed Rail, also known as HSR, was influenced by Japan, which runs a network of bullet trains in their country on Shikasen technology, making many cities well connected to others. According to reports, Japanese Prime Minister Shinzo Abe offered to provide US\$ 12 billion of soft loans to build India’s first Bullet Train. The loan was offered at an interest rate of 0.1 per cent per year with repayment over 50 years and a moratorium for the first 15 years. The Japanese Government will be bearing 80 per cent of the total project cost whereas the increase in cost estimates has to be borne by both India and Japan.

The reason this deal between India and Japan is considered path-breaking is that there is currently no financial institution in India that could provide such a huge funding to be repaid over as long a time as 50 years.

**Answer the following questions:**

66.	The ..... for the Bullet Train project was laid recently. (a) railway track                      (b) signalling system (c) foundation stone                      (d) None of these	(c) foundation stone
67.	According to PM Modi, the two benefits that the bullet train will bring are : (a) provide pace to travel and faster trains (b) provide pace to train travel and faster results (c) provide pace to development and faster trains (d) provide pace to development and faster results	(d) provide pace to development and faster results
68.	The meaning of <i>path-breaking</i> is used in the last para. of the passage is (a) tremendous                      (b) innovative (c) exciting                      (d) None of these	(b) innovative

	<p><b>Read the passage given below and fill in the blanks by choosing the most appropriate word/phrases from the given options.</b></p> <p>Jeans have become one of the most worn pieces of clothing in the world. Everybody ... (69)... them, from the rural farmer to the urban lawyer and from models to housewives. But why have jeans become so ... (70)...? You'll get many answers. For some people they look cool, for others jeans are simply comfortable. Jeans were first designed as durable trousers for farm workers and miners in the states of the American west. A Nevada tailor, Jacob Davis, had the idea of using copper bolts at the corner of the pockets to make them stronger. They became popular ... (71)... and soon many people bought them.</p>	
69.	<p>(a) are wearing                      (b) wears (c) will wear                        (d) was wearing</p>	(b) wears
70.	<p>(a) expensive                        (b) infamous (c) outdated                         (d) popular</p>	(d) popular
71.	<p>(a) vaguely                         (b) comfortably (c) slowly                            (d) instantly</p>	(c) slowly
72.	<p><b>Directions:</b> In the following questions, some parts of the sentence have been jumbled up. You are required to rearrange these parts which are labelled P, Q, R and S to produce the correct sentence. Choose the option with proper sequence.</p> <p>The judge _____</p> <p>(P) when he was presented in court (Q) sentenced the prisoner to life imprisonment (R) by the police (S) last week</p> <p>(a) PRSQ      (b) SRPQ      (c) QPRS      (d) QRSP</p>	(c) QPRS
73.	<p>Choose the group of words that shows the same relationship.</p> <p>Bible: Bhagwat Geeta :: _____ : _____</p> <p>(a) Bat: Ball                              (b) Listen: Care (c) Brinjal: Lady finger                (d) Cricket: Rain</p>	(c) Brinjal: Lady finger
74.	<p>What is the jumbled word of 'GINS'?</p>	SIGN
75.	<p>Select the most appropriate meaning of the given phrase/idiom.</p> <p>Dance to someone's tune</p> <p>(a) Argue with others on petty matters (b) Delay in making a decision (c) Do what others want you to do (d) Be engaged in an energetic activity</p>	(c) Do what others want you to do

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