

 <b>MACRO</b> VISION ACADEMY	<b>Entrance Paper (2023-24)</b>		<b>For Office Use Only</b>
	<b>Class:</b>	XI MATHEMATICS (SET-A)	
	<b>Time:</b>	02:30 Hrs.	
	<b>M.M:</b>	75	

### Personal Information

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

**City:-** \_\_\_\_\_ **Mobile No:-** \_\_\_\_\_ **Exam Date:-**    /    / 2023

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

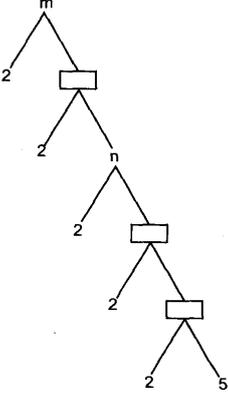
#### GENERAL INSTRUCTIONS:

- All questions are compulsory.
- Section A contains 25 questions (from 1-25) of Mathematics.
- Section B contains 15 questions (from 26-40) of Physics.
- Section C contains 15 questions (from 41-55) of Chemistry.
- Section D contains 10 questions (from 56-65) of Biology.
- Section E contains 09 questions (from 66-74) of English.

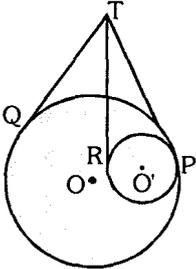
Mathematics (25)	Physics (15)	Chemistry (15)	Biology (10)	English (10)	OBTAINED MARKS (75)

Section-A Mathematics		
Q.N	Questions	Answers
1.	The HCF and LCM of two numbers are 9 and 90 respectively. If one number is 18, find the other.	
2.	If $\alpha$ and $\beta$ are the zeroes of $x^2 + 7x + 12$ , then the value of $\frac{1}{\alpha} + \frac{1}{\beta} + 2\alpha\beta$ is _____.	

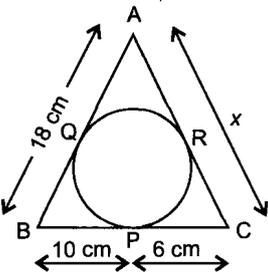
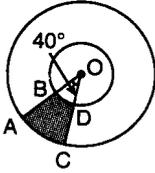
**Rough Work**

3.	<p>In the adjoining factor tree, find the value of m &amp; n.</p> 	
4.	<p>Water flows at the rate of 10 m per minute from a cylindrical pipe 5 mm in diameter. A conical vessel whose diameter is 40 cm and depth 24 cm is filled.</p> <p>The time taken to fill the conical vessel is _____.</p> <p>(a) 50 min                                      (b) 50 min. 12 sec.  (c) 51 min. 12 sec                              (d) 51 min. 15 sec.</p>	
5.	<p>The pair of equations <math>y = 0</math> and <math>y = -7</math> has _____ solutions.</p>	
6.	<p>For what value of k, do the equations <math>3x - y + 8 = 0</math> and <math>6x + ky = -16</math> represent coincides lines?</p>	
7.	<p>What value of k, the equation <math>x^2 - 2kx + 1 = 0</math> will have equal roots?</p>	
8.	<p>Find the roots of the equation: <math>\frac{1}{x} - \frac{1}{x-2} = 3, x \neq 0, 2</math></p>	
9.	<p>If the 8<sup>th</sup> term of an A.P. is 31 and 15<sup>th</sup> term is 16 more than 11<sup>th</sup> term, find the A.P.</p>	

**Rough Work**

10.	<p>In the given figure, there are two circles with the centres O and O' touching each other internally at P. Tangents TQ and TP are drawn to the larger circle and tangents TP and TR are drawn to the smaller circle. Find TQ:TR</p> 	
11.	<p>A flag pole 18 m high casts a shadow 9.6 m long. Find the distance of the top of the pole from the far end of the shadow.</p>	
12.	<p>Two numbers are in the ratio 2:3. If 5 is added to each number, ratio becomes 5:7. Find the numbers.</p>	
13.	<p>Find the point on the x-axis which is equidistant from (2, -5) and (-2, 9).</p>	
14.	<p>The line <math>3x + 2y = 24</math> meets the y-axis at A and the x-axis at B, C is a midpoint of AB. Find the coordinates of C.</p>	

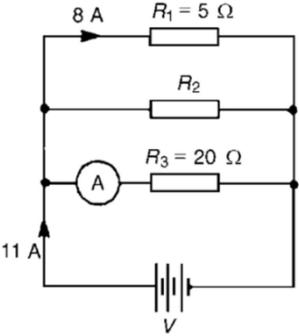
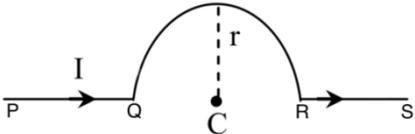
**Rough Work**

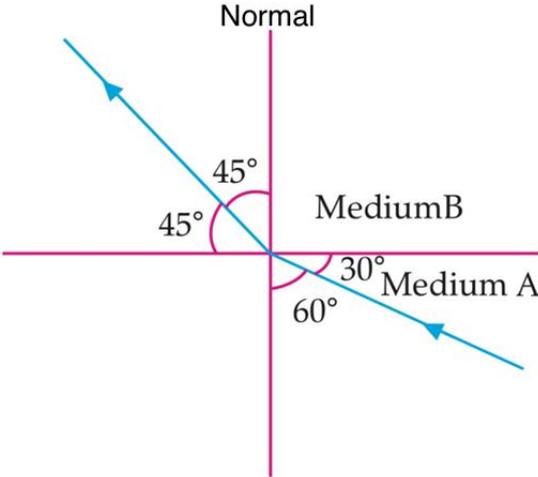
15.	If $\operatorname{cosec} \theta = \frac{13}{12}$ , find the value of $\cot \theta + \tan \theta$ .	
16.	If $\tan \theta = 1$ , find the value of $\frac{\cos^2 \theta + \sec^2 \theta}{\cos^2 \theta - \sec^2 \theta}$ .	
17.	The ratio of the length of a pole and its shadow is $1 : \sqrt{3}$ . The angle of elevation of the sun is _____.	
18.	In Fig. all three sides of a triangle touch the circle. Find the value of $x$ . 	
19.	If $x, y, z$ are in A.P., then $(x + 2y - z)(x + z - y)(z + 2y - x)$ is equal to:- (a) $xyz$ (b) $2xyz$ (c) $4xyz$ (d) None	
20.	Find the area of a sector of a circle with radius 6 cm if angle of the sector is $60^\circ$ .	
21.	Find the area of the shaded region in figure, if radii of the two concentric circles with centre O are 7cm and 14 cm respectively and $\angle AOC = 40^\circ$ . 	

**Rough Work**

22.	If both the roots of the equations $k(6x^2 + 3) + rx + 2x^2 - 1 = 0$ and $6k(2x^2 + 1) + px + 4x^2 - 2 = 0$ are common then $2r - p$ is equal to:	
23.	The mean and median of a data are 14 and 15 respectively. The value of mode is _____	
24.	One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a red face card	
25.	A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$ . Find the number of blue marbles.	
<b>Section-B</b>		
<b>Physics</b>		
26.	Combining the five resistances each of value $\frac{1}{5}$ ohm, the maximum resistance that can be obtained is:	
27.	The conductivity of a superconductor is:	
28.	You are given three bulbs of 25 W, 40 W and 60 W rated at same voltage. Which of them has lowest resistance?	
29.	Two free parallel wires carrying currents in opposite directions then force between them will be attractive or repulsive?	

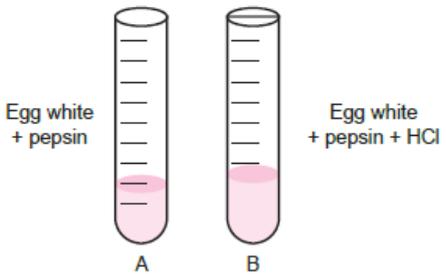
**Rough Work**

30.	<p>For the circuit shown in given figure, determine the value of resistor <math>R_2</math> ?</p> 	
31.	<p>On which point the magnetic field intensity produced due to a current carrying circular coil is maximum?</p>	
32.	<p>A length of wire carries steady current. (i) It is bent first to form a circular plane coil of one turn. (ii) The same length is now bent to give a double loop of smaller radius.</p> <p>In which case the magnetic field produced at the centre by the same current will be maximum?</p>	
33.	<p>A wire as shown in figure carries a current <math>I</math> ampere. The semicircle has a radius <math>r</math>. The magnetic field at the centre <math>C</math> due to wire <math>PQ</math> will be _____</p> 	
34.	<p>A wire carrying a current of <math>5A</math> is placed parallel to a magnetic field of <math>2T</math>. The force on each centimeter of the wire is</p>	
35.	<p>At which angle the force acting on a moving charge <math>Q</math> in the magnetic field <math>B</math> is maximum?</p>	
36.	<p>In your laboratory you trace the path of light rays through a glass slab for different values of angle of incidence (<math>\angle i</math>) and in each case measure the values of the corresponding angle of refraction (<math>\angle r</math>) and angle of emergence (<math>\angle e</math>).</p> <p>What is the relation between (<math>\angle i</math>) and <math>\angle e</math>?</p>	

37.	<p>A teacher sets up the stand carrying a convex lens of focal length 15 cm at 42.7 cm mark on the optical bench. He asks four students A, B, C and D to suggest the position of screen on the optical bench so that a distinct image of a distant tree is obtained almost immediately on it. The positions suggested by the students were as:</p> <p>(i) 12.7 cm    (ii) 29.7 cm    (iii) 57.7 cm    (iv) 72.7 cm</p> <p>By which student correct position of screen was suggested?</p>	
38.	<p>Figure shows a ray of light as it travels from medium A to medium B. What is the Refractive index of the medium B relative to medium A.</p> 	
39.	<p>Write the name of the phenomenon of visible of light path in a colloidal solution.</p>	
40.	<p>Read the following statements carefully</p> <p>(i) The prism behaves same as that of rectangular glass slab.</p> <p>(ii) All the colours have different angles of deviation in case of dispersion through prism.</p> <p>(iii) All the colours travel with the same speed of light in glass.</p> <p>(iv) Dispersion of light is observed in case of rectangular glass slab.</p> <p>Which of the above statement/s is true?</p>	

**Section-C****Chemistry****Give one word for the following:**

41.	How many carbon- carbon and carbon-hydrogen single bonds are present in cyclohexane molecule?	
42.	A metal M does not liberate hydrogen from acids but reacts with oxygen to give a black coloured product. Identify M and the black coloured product.	
43.	A sweet smelling compound A with molecular formula $C_4H_8O_2$ on hydrolysis with dil. $H_2SO_4$ gives two compounds B and C. Identify B and C.	
44.	Silver articles become black on prolonged exposure to air. This is due to the formation of .....	
45.	Amongst the metals sodium, calcium, aluminium, copper and magnesium, name the metal: Which reacts with water only on boiling.	
46.	What is the common name of iron (III) oxide?	
47.	Hydrogen burns with a _____ sound.	
48.	What type of compound is formed when a carboxylic acid reacts with an alcohol in the presence of conc. $H_2SO_4$ ?	
49.	Identify the reducing agent in the following reaction: $NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$ .	
50.	What is the colour change in turmeric solution with base?	
51.	Name an oxidising agent which can oxidise ethanol to ethanoic acid?	
52.	A white powdery substance X having strong smell of chlorine is used for disinfecting water. Identify the substance X.	
53.	Write the formula of the salt formed by the reaction of Carbonic acid and Sodium hydroxide.	
54.	What is the colour of fumes obtained on heating lead nitrate?	

55.	Complete the equation: $2HgS(s) + 3O_2(g) \xrightarrow{\text{Roasting}} \dots\dots\dots + 2SO_2(g) \uparrow$	
<b>Section-D</b> <b>Biology</b>		
56.	Name the opening in human body through which the waste is expelled out of the body	
57.	Name the biological catalyst which bring about chemical digestion of food	
58.	Name the term used for waste materials which can be broken down to non-poisonous substances in nature in due course of time by the action of micro-organisms like certain bacteria and fungi	
59.	A blue colour the flower plant denoted by BB is cross breed with that of white colour flower plant denoted by bb.  State the expected ratio of the genotypes BB and Bb in the F2 progeny	
60.	A plant that has lost the capacity to produce seed. Name a process using which it can reproduce?	
61.	A squirrel is in a scary situation. Its body has to prepare for either fighting or running away. The immediate changes that take place in its body so that the squirrel is able to either fight or run. Name the hormone responsible for all such changes.	
62.	Name the plant hormone responsible for inhibition of growth.	
63.	A student sets up an experiment to study the role of enzymes in digestion of food.  <div style="text-align: center;">  <p style="margin-left: 100px;">Egg white + pepsin</p> <p style="margin-right: 100px;">Egg white + pepsin + HCl</p> <p style="margin-left: 100px;">A</p> <p style="margin-right: 100px;">B</p> </div> In which test tube, the digestion of protein will occur?	

64.	After a road accident, a person lost his memory for a few days. In which part of his brain got injured?	
65.	Which type of cell division involved in binary fission?	
<b>Section-D</b> <b>English</b>		
<b>Read the following passage and answer the following.</b>		
<p>1. When a person is called 'great there is always a reason behind it. The deeds of that person make him great or hateful. Everybody is aware of the fact that Alexander is called 'Alexander the Great'. He is known by this adjective because he was not only a great conqueror but also a nice human being. Alexander set the clearest example of his regard for women when he defeated the Persian forces. The Persian King Darius III fled for his life. He departed in such a haste that the royal entourage, including his family, was left behind.</p> <p>2. After his great victory, Alexander was astounded to see the quarters that were left behind by the defeated Persian king. There were huge piles of gold and silver. Even daily implements were made of gold. There was a magnificent bath tub and luxurious beds. King Darius' family including his elderly mother, the queen, and his two daughters were there as well.</p> <p>3. Alexander could have done the worst to these women and no one would have blinked an eye. Naturally, the women were in the deepest depths of terror and despair. But Alexander was an honourable man. He immediately had the message conveyed to the women that Darius had escaped; that he, Alexander, would not harm them; and that they would continue to receive the same treatment and protection that they had under their own king. He made every effort to lighten their sense of anxiety and humiliation of being taken prisoners. He gave them an allowance bigger than the allowance they had before.</p> <p>4. The old queen mother was so grateful for Alexander's kind treatment that she grew to love and respect him with all her heart. When the Persian king heard of the consideration that Alexander had shown to his family, he is said to have proclaimed, 'No one deserves to inherit my throne more than Alexander.'</p>		
<b>Answer the following questions:</b>		
66.	<p>What qualities made Alexander known by the adjective 'Alexander the Great'?</p> <p>(a) A great conqueror                      (b) A nice human being</p> <p>(c) Regard for women                      (d) All of these</p>	
67.	<p>What is the correct order of the information given below:</p> <p>i. There was a magnificent bath tub and luxurious beds.</p> <p>ii. Alexander was an honourable man.</p> <p>iii. Alexander was a great conqueror and a nice human being.</p> <p>iv. The old queen mother was grateful for Alexander's kind treatment.</p> <p>(a) iii, ii, i, iv    (b) ii, iii, i, iv    (c) iii, i, ii, iv    (d) iv, ii, i, iii</p>	



## **Rough Work**