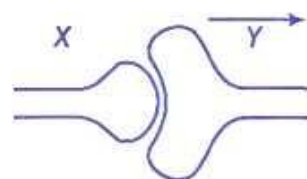


## Olympiad Aptitude Test Science- Grade 10

- Sun is also a star like rest of others but it does not twinkle. Why?
  - The distance between the sun and the earth is much less than other stars
  - Sunlight does not undergo atmospheric refraction
  - Both a and b
  - Neither a nor b
- (i) If the child is a male, then the chromosome inherited from the mother is and from the father is  
(ii) If the child is a female, then the chromosome inherited from the mother is and from the father is
  - (i)X;Y (ii) X; Y
  - (i)X;Y (ii) X; X
  - (i)X;X (ii) Y; X
  - (i)Y;Y (ii) X; X
- Solar cell panels cannot be used to meet all our domestic needs of electricity. Why?
  - To operate the domestic appliances alternating current is required
  - Solar energy is stored in batteries to produce direct current
  - Conversion of direct current to alternating current increases the cost
  - All of the above
- The component of sunlight which mainly carries heat with it is
  - infrared rays
  - ultraviolet rays
  - visible light
  - All of the above
- How much solar energy will be received by  $1 \text{ m}^2$  in five hours, if the solar constant is  $1.4 \text{ kW}$  per square metre?
  - $2.52 \times 10^5 \text{ kJ}$
  - $2.52 \times 10^4 \text{ kJ}$
  - $2.52 \times 10^5 \text{ kJ}$
  - $2.52 \times 10^6 \text{ kJ}$
- The diagram given below represents the synapse between two mammalian myelinated neurons, i.e. X and Y. The arrows show the direction of impulses.



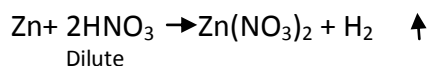
**Direction** (Q. No. 3-5) *Read the following passage and answers the questions that follow:*

Providing the world with energy in a sustainable manner is one of the most preeminent issues in today's society. Converting the solar energy into an easily usable form is one of the most captivating solutions; because daily sunshine gives energy to the earth is 10000 times more than existing global energy consumption. Photovoltaic devices, which convert light into electricity, are thus widely studied as a way to collect solar energy. Although, the photovoltaic industry has seen a large growth rate in the past couple of decades, yet the energy generated by solar cells contribute to less than 0.1% of the total world energy consumption.

The transmission of impulses across the synapse is brought about by the

- breakdown of the terminal membrane of X
- passage of an electric current between X and Y
- release of sodium ions from X
- secretion of a chemical from X

7. Consider the following reaction:



But this reaction is not possible. The reason for this is that

- I. nitric acid is a stronger oxidizing agent.
- II. nitric acid is a stronger reductant.
- III. nitric acid oxidises hydrogen to water.
- IV. nitric acid reduces water to hydrogen.

The correct reasons are:

- a. I and III
- b. II and IV
- c. I and IV
- d. None of the above

8. In man, the A, B, AB, O blood groupings are controlled by a system of multiple alleles. A man of blood group 'A' marries a woman of blood group 'B' and they have one child. Which one of the following statements about the child's blood is correct?

- a. It could only be group A
- b. It could only be group A or group B
- c. It could only be group AB
- d. It could be any of the groups A, B, AB, O

9. The list shows reactions in which ethanol is either a reactant or a product.

- I. Combustion of ethanol.
- II. Conversion of ethene to ethanol.
- III. Fermentation of glucose.
- IV. Oxidation of ethanol to ethanoic acid.

In which reactions is water also either a reactant or a product?

- a. I, III and IV
- b. II, III and IV
- c. I, II and IV
- d. Only III

10. Names of some of the organic compounds are hidden in the following crossword puzzle:

T	E	L	Y	H	T	E	M	E	T	H	Y	
D	I	E	T	H	Y	L	E	S	T	E	R	
E	T	T	R	i	P	Y	O	T	M	O	T	L
H	E	H	P	R	O	R	H	E	H	H	O	
S	O	A	P	E	L	E	A	T	O	Y	E	
R	P	N	T	H	E	C	N	H	C	N	C	
N	O	O	N	E	T	Y	O	Y	L	E	Y	
E	I	I	N	H	A	L	L	A	T	S	G	
B	<sup>1</sup> u	C	E	A	M	G	G	H	T	O	P	
E	N	A	H	T	E	M	E	L	N	A	P	
T	A	C	R	E	C	N	Y	S	O	R	S	
O	N	I	E	N	E	Y	E	A	P	E	E	
C	L	D	E	E	T	H	N	D	E	T	G	

How many of them react with sodium metal to give sodium salt?

- a 9      b 7      c 5      d 3**

11. Which method of birth control prevents the implantation of the fertilised egg?

- a Pills (hormonal)
- b Condom (mechanical)
- c Spermicide (chemical)
- d Vasectomy (surgical)

12. The extract shown is part of a safety officer's report on how electrical items were being used in a house. 'The hair dryer had a plastic case with double insulation, so only the live and neutral leads were connected to the plug. When not in use, the dryer was kept in a metal cabinet but it was taken into the bathroom to be used.'

Which underlined comment indicates an electrical hazard?

- a. Plastic case with double insulation
- b. Only the live and neutral leads were connected to the plug
- c. Kept in a metal cabinet
- d. Taken into the bathroom to be used

- 13.** In domestic cats, the genes for yellow fur and black fur are allelic pair which are sex-linked and codominant.

When black females are mated with yellow males, which one of the following is the expected proportion of heterozygotes in the offspring?

- a. 0%
- b. 25%
- c. 50%
- d. 75%

- 14.** The current in a power tool, working normally is 2 A.

How much current is in each of the three wires connecting the tool to the mains?

	Live	Neut al	Earth
<b>a</b>	2A	0	0
<b>b</b>	2A	0	2A
<b>c</b>	2A	2A	0
<b>d</b>	2A	2A	2A