# ISO SCIENCE OLYMPIAD
Sample Paper

Basic:(3Points)

1. The principle of chromatography is

   (A) Liquids with lower boiling points boil off first

   (B) Salts with lower solubility crystallize out from saturated solution when cooled

   (C) The rate of diffusion of liquids varies

   (D) All liquids are not miscible in water

2. 90 g of $KClO_3$ when heated produced 1.94 g of Oxygen and residue KCl left behind weighs 2.96 g. This chemical reaction follows

   (A) Law of multiple proportion

   (B) Law of conservation of mass

   (C) Law of constant proportion

   (D) Law of reciprocal proportion

3. Which of the following isotopes incorrectly represents the natural isotopes of the element shown in column?

	Column	Isotopes
(A)	Cl	Cl – 35 and Cl - 37
(B)	O	O -11, O -12 and O – 13
(C)	C	C – 12, C – 13 and C – 14
(D)	H	H – 1, D – 2 and T - 3

4. Which of the following shows the incorrect location of the somatic stem cell in the human body?
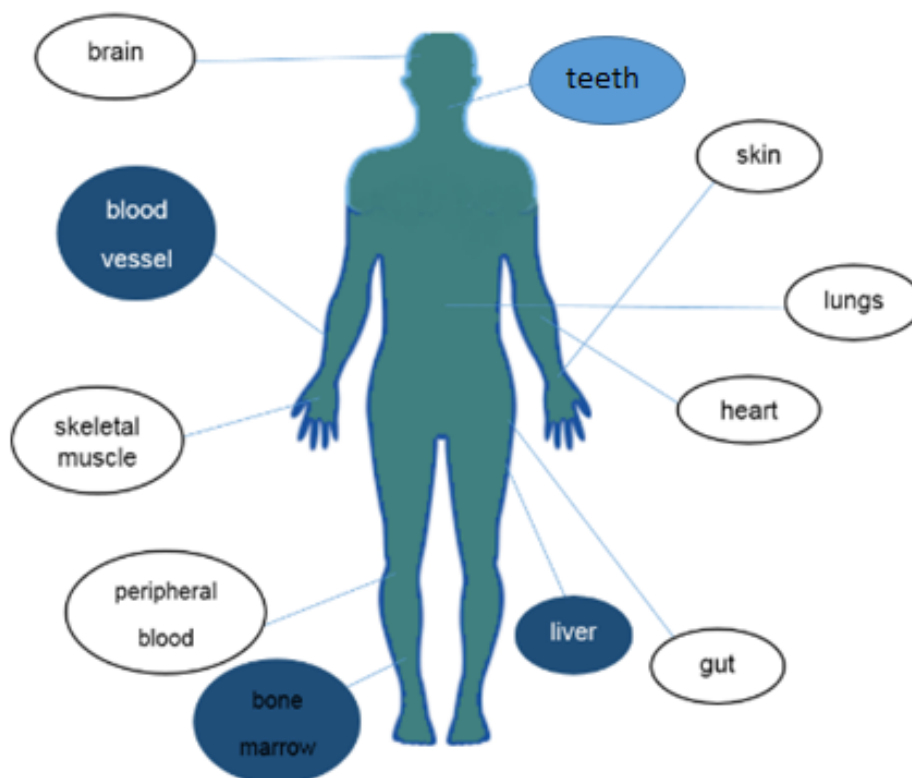

(A) Liver   (B) Lung
(C) Peripheral blood   (D) Gut

5. A submarine is accelerating through the water at a constant depth. It is being acted by forces as shown. Which of the following statements is correct?
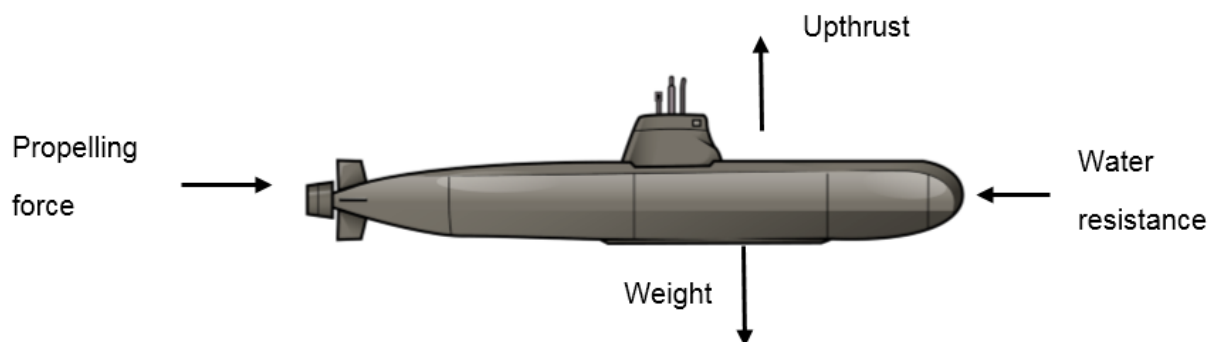
(A) The up thrust is balanced by the weight
(B) The resultant force of the four forces is zero
(C) Gravity has no effect on the submarine
(D) The water resistance balanced the propelling force

Foundation: (3 Points)

6. The graph below shows how the velocity varies with time for a given body. Which of the following statement(s) is/are true?
   I.   The resultant force acting on the body is never zero
   II. The forces acting on the body are never constant for any period
   III. The object is never at rest

Velocity
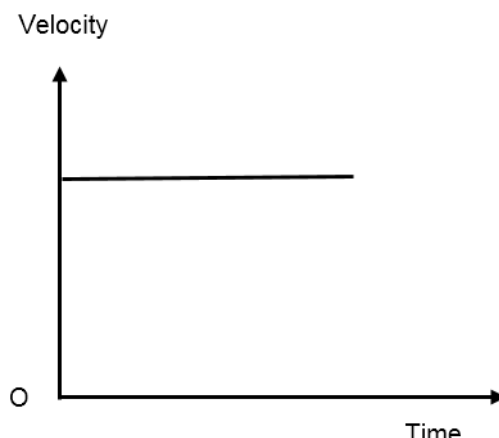
(A) I and II   (B) I, II and III   (C) II and III   (D) III only

7. Find the rise in temperature of 1kg of water if 1000 J of heat is supplied to it.

(A) $\left(\dfrac{1000}{4186}\right)^{\circ} C$

(B) $\left(\dfrac{4186}{1000}\right)^{\circ} C$

(C) $(1000 \times 4186)^{\circ} C$

(D) $(4186 - 1000)^{\circ} C$

8. Immunizations works on the principle that the immune system

(A) Senses an infectious microbe, and does not respond against it

(B) Responds with very less affect when it senses that the particular

(C) Develops a memory for a particular infection by something (vaccine) that mimics the particular microbe

(D) After the attack of infectious microbe, forgets it

9. The Leguminous plants shown in the given figure are used for the production of

(A) Pesticides

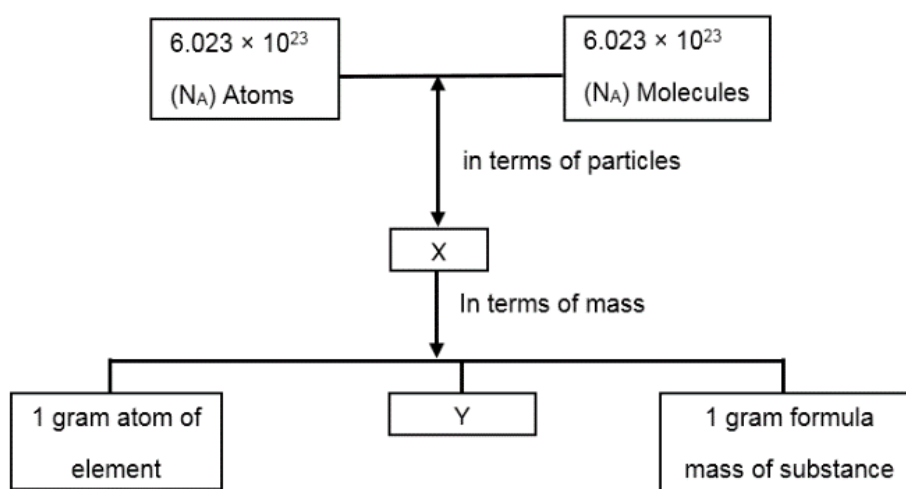(B) Green manure

(C) Antibiotics

(D) Vermin-compost

**10.** How is the Earth's atmosphere different from the atmosphere of Venus and Mars?

(A) The percentage of carbon dioxide on the Venus and the Mars is about 95-97%, which does not provide the suitable conditions to support life

(B) The percentage of carbon Monoxide on the Venus and the Mars is about 95-97%, which does not provide the suitable conditions to support life

(C) The percentage of Oxygen on the Venus and the Mars is about 95-97%, which does not provide the suitable conditions to support life

(D) The percentage of nitrogen gas on the Venus and the Mars is about 95-97%, which does not provide the suitable conditions to support life

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Exploration: (5Points)
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11. Alex's younger brother is learning how to read a thermometer, he asks, "Why does the red stuff in the thermometer goes up when it gets hot outside?" What is a correct explanation that Alex can give to his brother?

    (A) When the red stuff gets warmer, it increases in volume. Since it is confined in the tube, it must go up

    (B) The red stuff in that little tube rises up because it is really sensitive to heat

    (C) The red stuff goes up because the pressure of coldness is not there and the red stuff is free to move

    (D) The heat hits the bottom of the thermometer and boosts up the temperature

12. Following table shows the summary of different relationships in terms of mole concept. Choose suitable option for X and Y.

6.023×10^{23} (N_A) Atoms		6.023×10^{23} (N_A) Molecules

in terms of particles

X

In terms of mass

1 gram atom of element	Y	1 gram formula mass of substance

    (A) X – I Mole, Y – 1 gram mole of substance

    (B) X – 3 Mole, Y – 2 gram mole of substance

    (C) X - I Mole, Y – 1.5 gram mole of substance

    (D) X – 1.5 Mole, Y – 1.5 gram mole of substance

13. Study the Venn-diagram and identify X.

Amoeba

Euglena

X

Trypanosoma
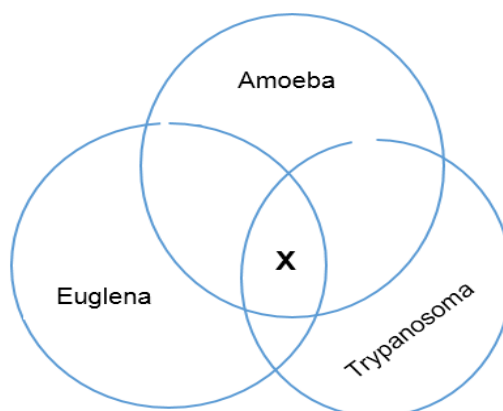
    (A) Binary fission   (B) Contractile vacuole   (C) Holozoic nutrition   (D) Multiple fission

14. The displacement-time graph of an accelerated body is shown in following figure. Motion is along a straight line
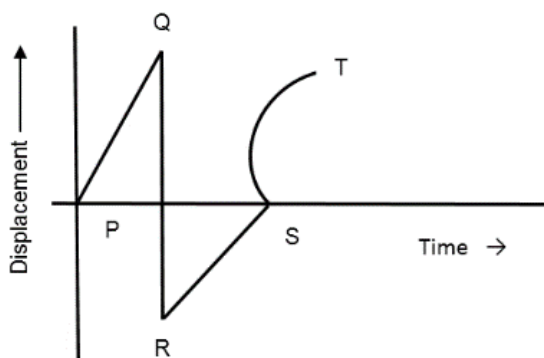
(A) PQ only   (B) RS Only   (C) ST only   (D) PQ and ST both

15. The diagram below shows a ball of diameter 30 cm placed against a step of height 15 cm. If the ball has a mass of 15 kg, what minimum force F applied at a point as shown is required to move the ball up the step? Assume that the gravitational force acting on a mass of 1.0 kg is 10 N.
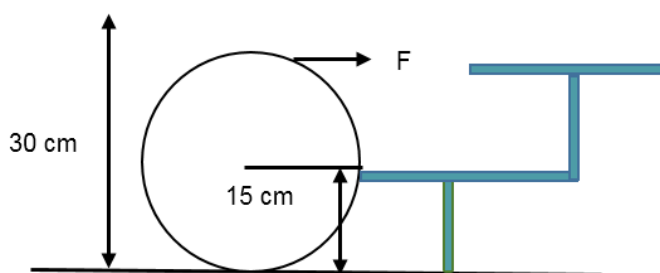
(A) 150 N   (B) 100 N   (C) 50 N   (D) 200 N

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ANSWER KEY							
1-C	2-B	3-B	4-B	5-A	6-D	7-A	8-C
9-B	10-A	11-A	12-A	13-A	14-A	15-A	