INTERNATIONAL OLYMPIAD ACADEMY

**GRADE–1 & 2**

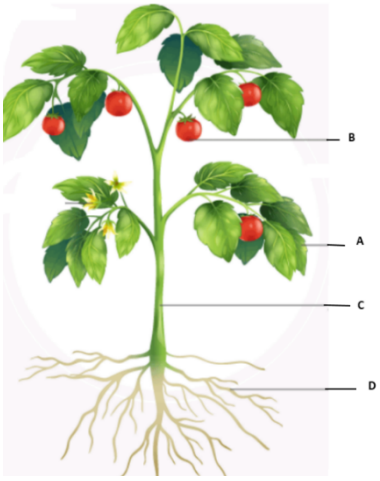
**EINSTEIN**

# ISO SCIENCE OLYMPIAD

## Sample Paper

**Basic : (3 Points)**

**1.** Which labelled part is found only in adult plants and not in young plants?




(A) A (B) B (C) C (D) D

**2.** What is the function of a tail in fishes?
(A)It helps the fish to move in water (B) It helps the fish to breath in water
(C) It helps the fish to change direction in water (D) It helps the fish to stay upright

**3.** Which of these birds make a nest on the ground from pebbles and stones?
(A) Eagle (B) Hen (C) Penguin (D) Crow

**4.** Which of the following statement is correct?
(A)The body systems work together to form the human body
(B) Heart, lungs and bones form the muscular system
(C)Brain, nerves and spinal cord form the circulatory system
(D) Nose, windpipe and lungs form the digestive system

**5.** Which of the plants is used to cure itching and insects' bites?
(A) Tulsi (B) Isabgul (C) Neem (D) Cinchona

## Foundation: (4 Points)

**6.** Observe the figures shown below and answer the following questions:

A. 

B. 

What will you do to change water from fig. A to Fig. B?

(A) Heating of water
(B) Cooling of water
(C) First heat then will cool the water
(D) None of them

**7.** Why can we see the objects in a room?

(A) They reflect light that falls on them
(B) The things give off light to the air
(C) The objects send light away from our eyes
(D) None of them

**8.** In this diagram two boys are using the same amount of force to push the box. What will happen to the box?

(A) The box will move to the left
(B) The box will move to the right
(C) The box will move left and then right
(D) The box will not move at all

**9.** Man went to the moon for the first time in a spacecraft called _____.

(A) Apollo 9 (B) Apollo 11 (C) Sputnik 2 (D) Sputnik 1

**10.** Identify the leaf of hibiscus plant.

(A) 

(B) 

(C) 

(D) 

## Exploration: (5 Points)

**11.** Observe the figures shown below and answer the following question.

P

Q

What is the importance of the things shown in the above figures (P and Q)?

(A) Both are used as fuel
(B) Both are used for cooking
(C) Both (A) and (B)
(D) None of the above

**12.** "I am a natural resource that is hidden deep under the earth. I am also present in your food." Guess who am I?

(A) Minerals (B) Soil (C) Rock (D) Water

**13.** How does an earthworm breathe in the soil?

(A) It breathes the air present in soil
(B) It does not breathe
(C) It stores outside air then breathes in the soil
(D) None of them

**14.** What does the instrument shown in the figure (box X) produce?

(A) Soft sound
(B) Pleasant sound
(C) Noise
(D) All of the above

**15.** The given figure resembles _____.

(A) Solar Eclipse (B) Lunar Eclipse (C) Eclipse (D) Both (A) and (B)

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## ANSWER KEY

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

INTERNATIONAL OLYMPIAD ACADEMY

GRADE–3 & 4

NEWTON

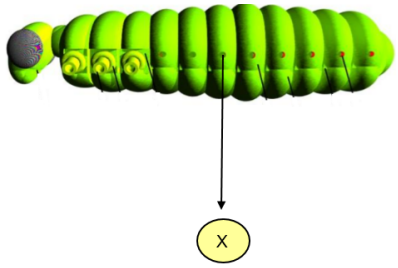
# ISO SCIENCE OLYMPIAD

## Sample Paper

### BASIC : (3 Points)

**1.** Riya is solving a puzzle. Which system of her body she is using while solving the puzzle?
(A) Respiratory system (B) Digestive system (C) Nervous system (D) Circulatory system

**2.** Identify X in the given diagram and answer the following question.
Which of the following statement is incorrect about X?




(A) It lies on the exoskeleton
(B) In most of the insects it is located along the thorax and abdomen
(C) Fluid enters an insect body through X
(D) Air enters an insect's body through X

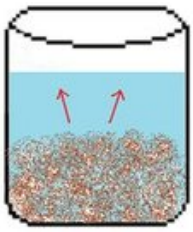
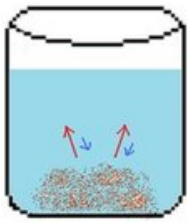
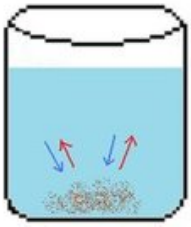
**3.** What is the similarity between energy possessed by a running boy and a running car?
(A) Both possess kinetic energy
(B) Both possess gravitational energy
(C) Both possess buoyant force
(D) None of these

**4.** Identify the medium through which sound can travel.
(A) Solid and liquid (B) Gas and Liquid (C) Both a and b (D) None of the above

**5.** Why is plastic good insulating material for making ice-cubes?
(A) It is cheap
(B) It decreases friction with the water
(C) It is not a good conductor of electricity
(D) It is a good conductor of electricity

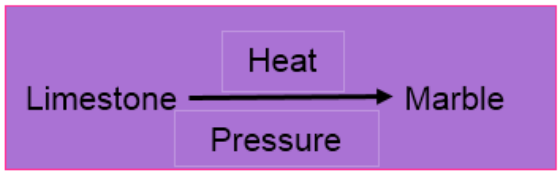
## FOUNDATION: (4-Points)

**6.** Which of the following diagram correctly represents the saturated solution?

(A)  (B)  (C)  (D) None of these

**7.** Name the rock used by dentists for polishing teeth.
(A) Granite (B) Basalt (C) Pumice (D) Obsidian

**8.** Study the table below and choose correct option for it.




**I.** Product formed has same chemical composition as limestone
**II.** Here, the reactant recrystallizes into marble
**III.** Product formed is softer than the reactant
(A) Only I (B) I and II (C) Only III (D) I and III

**9.** Name the only active volcano in the Indian subcontinent.
(A) Barren Island (B) Etna (C) Yasur (D) Pacaya

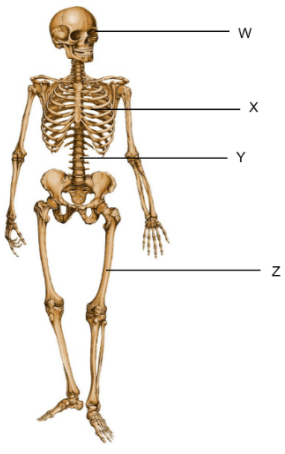
**10.** The object shown in the given diagram can be used by

(A) Mountaineers (B) Astronauts
(C) Asthma patient (D) All of them

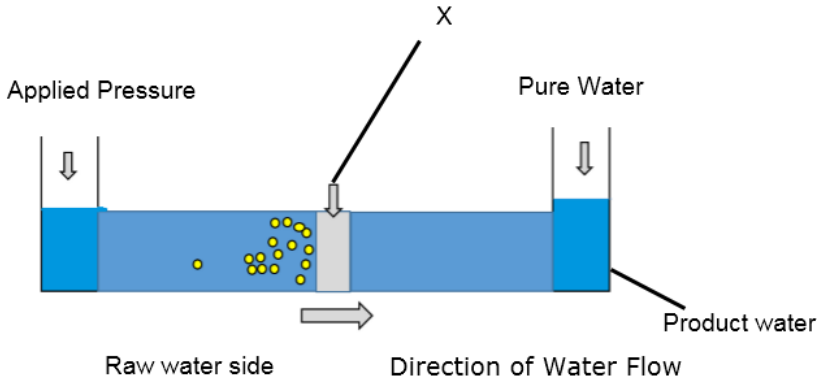


## Exploration: (5 Points)

**11.** Which of the following is incorrect regarding the parts of the given body system labelled as W, X, Y and Z?
(A) W – Encloses the brain
(B) X – Protects the heart
(C) Y – does not help in movement
(D) Z – Longest bone



**12.** The given diagram shows the process of reverse osmosis. What is correct about X shown here?




(A) X is a filter paper
(B) X is a semi permeable membrane
(C) X is an permeable membrane
(D) X is moisture

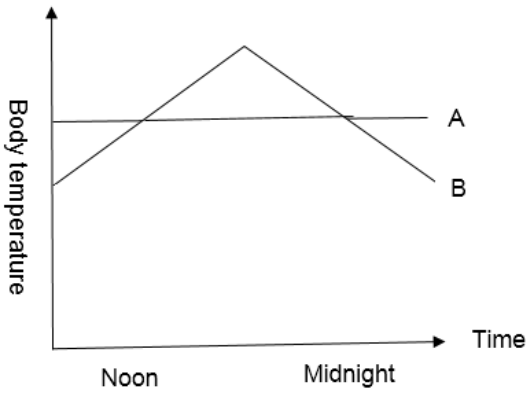
**13.** A bacteria cell reproduces by splitting itself into two every 15 seconds. If it starts with a single bacterium, how many bacteria would there be after a mintue?
(A) 4 (B) 5 (C) 8 (D) 16

**14.**

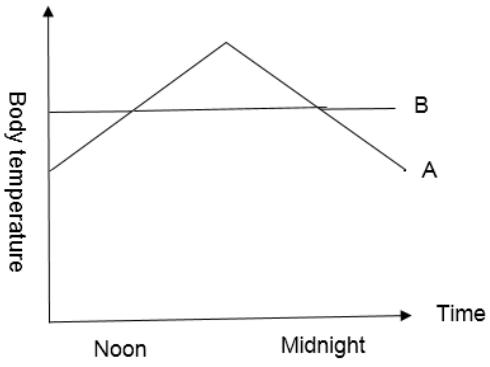
"Animals have different body coverings. Those with feathers and fur have a constant body temperature despite changes in the temperatures of their surroundings.

A group of students set out to research on the above fact. They measured the body temperature of two animals over a 12 – hour period. The two animals studied were toad (A) and rabbit (B). Which one of the following graph represents the temperature of the two animals correctly?

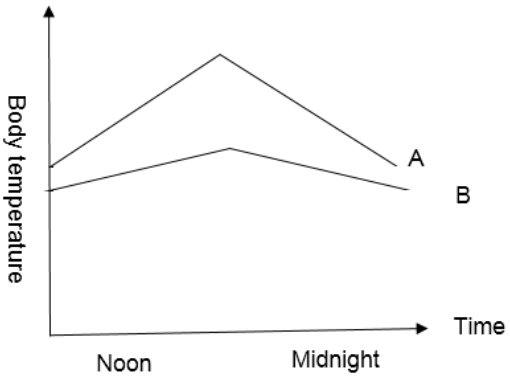
(A)



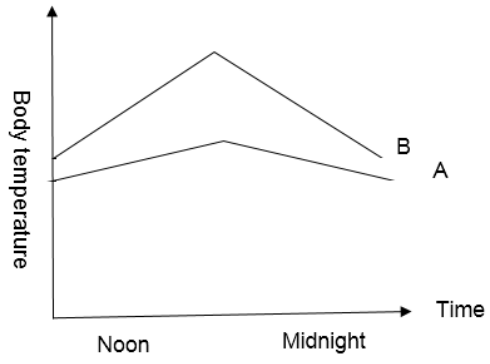

(B)



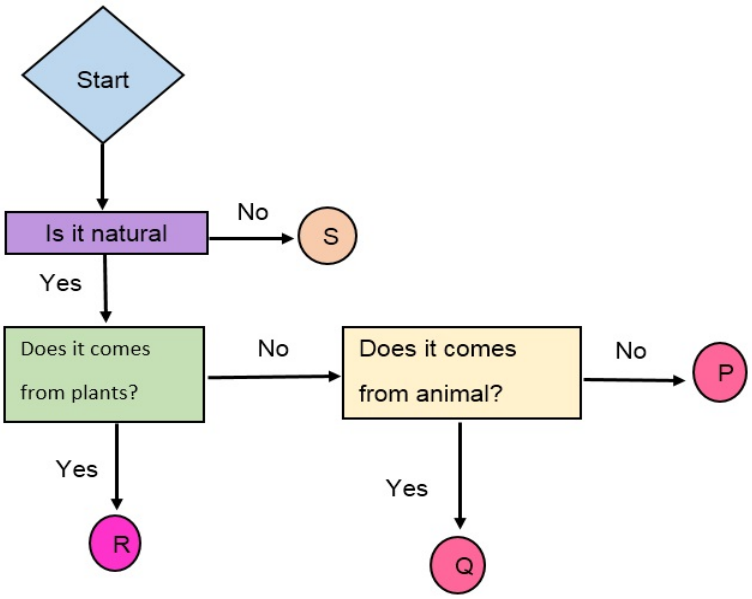

(C)




(D)



**15.** Study the given flowchart carefully. Jute and metal are represented by the letters _____ and _____ respectively.




(A) P and Q
(B) P and R
(C) R and S
(D) P and S

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**ANSWER KEY**

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

INTERNATIONAL OLYMPIAD ACADEMY

**GRADE–5 & 6**

**DARWIN**

# ISO SCIENCE OLYMPIAD

## Sample Paper

### Basic: (3 Points)

**1.** X is the part of a cell that carries information that controls the characteristics that are passed from one generation to the next generation. Identify X.

(A) Chloroplast (B) Cell membrane (C) Cytoplasm (D) Nucleus

**2.** _____ helps to maintain a constant body temperature in our body.

(A) Water (B) Roughage (C) Vitamins (D) Energy- Giving Food

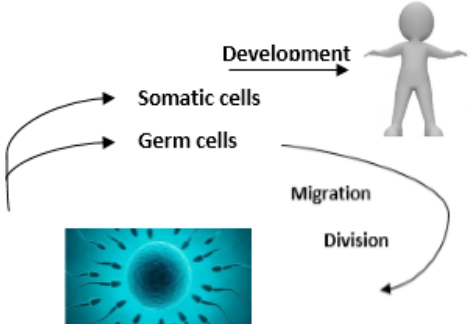
**3.** The criss - cross lines on the leaves show its _____.

(A) Stem (B) Venation (C) Design (D) Neither (A) nor (B)

**4.** Which of the following statement is correct about the circuit shown in the figure?

(A) The filament of the bulb is broken
(B) There is a break in the path of the current
(C) It will not glow as no current passes through its filament
(D) All of the above

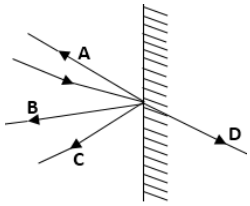
**5.** The diagram shows the role of germ cells and somatic cells in human reproduction. Which of the following is correct about the germ cells?




(A) Genetic variation can be inherited from one generation to another through germ cell
(B) Germ cells take part in reproduction
(C) Germ cells are found in plants and animals
(D) Both (A) and (B)

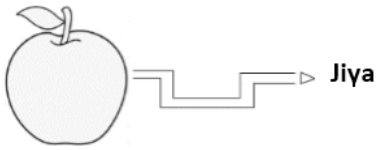
## Foundation: (4 Points)

**6.** The diagram below shows a ray of light shining on a mirror. Which ray correctly represents the ray that is reflected from the mirror?




(A) A
(B) B
(C) C
(D) D

**7.** Look at the diagram shown here carefully. What is the least number of mirrors of mirrors Jiya needs to help her to see the apple?

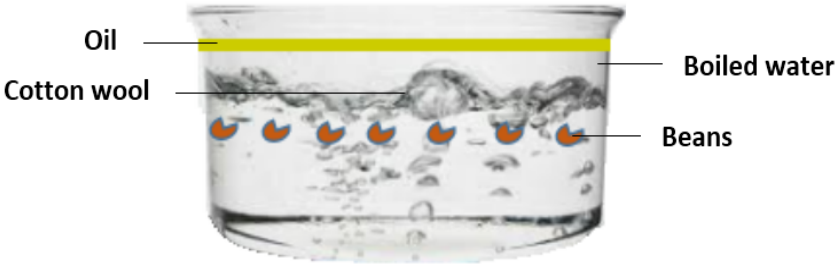



(A) 1 (B) 2 (C) 3 (D) 4

**8.** Which of the following statement is incorrect about D. D. T.?
(A) It has been widely used as a chemical pesticide for farming
(B) It degrades very slowly and gets accumulated from one tropic level to another
(C) Its high concentration causes adverse effect on living systems
(D) None of the above

**9.** Some radioactive waste leaked out from a landfill and contaminated a river. The river water was used to water plants in a nearby farm. If we examined the stem of those plants where you would expect to find radioactive substances?
(A) Phloem tubes (B) Xylem tubes
(C) In both xylem and phloem tubes (D) None of them

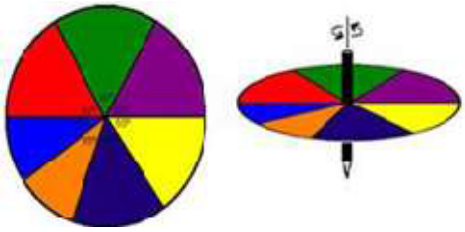
**10.** The beans shown in the figure did not germinate. What is the reason for this?




(A) There was no water (B) There was no warmth
(C) There was no oxygen (D) There were no nutrients

## Exploration: (5Points)

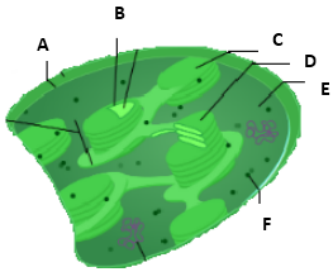
**11.** **i.** Collect the materials that you need.
**ii.** Glue the piece of paper to the cardboard.
**iii.** Cut the piece of paper and cardboard into equal size circles.
**iv.** Colour each of the seven sections a different colour.
**v.** Divide the circle into seven equal triangles.



Which of the following shows the correct order of the steps?

(A) (i)–(iii)–(ii)–(v)–(iv)
(B) (iii)–(ii)–(i)–(iv)–(v)
(C) (ii)–(i)–(iii)–(v)–(iv)
(D) (i)–(iv)–(ii)–(v)–(iii)

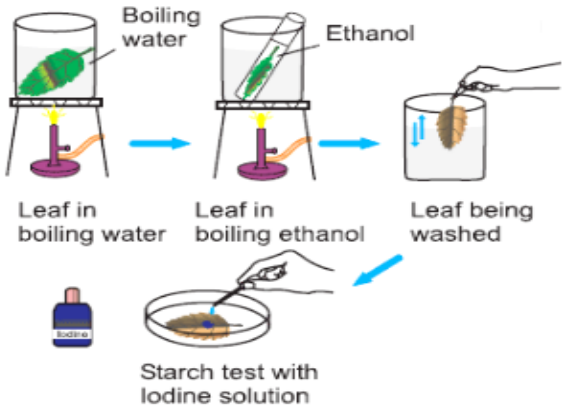
**12.** Study the plant cell shown below.




Which of the following is correct match on the basis of the given figure?

(A) The region where chromosomes can be found- F
(B) The part which gives the cell its rigid shape- B
(C) Controls the movement of substances in and out of a cell- A
(D) The region where light energy is converted into chemical energy- E

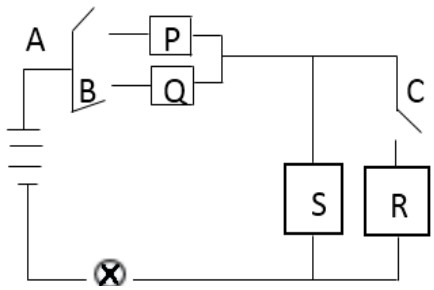
**13.** Observe the experiment shown here with a leaf of a plant and answer the following question.




The above test demonstrates that

(A) Leaves get the starch from chlorophyll
(B) Starch is essential for the presence of chlorophyll
(C) Iodine reacts with leaf and forms blue black color
(D) Leaves make their food as starch

**14.** P, Q R and S are objects placed in the circuit shown below. A, B and C are switches.



The table shows what happen when the switches are closed.

| Switch (es) closed | Bulb is lit |
|---|---|
| A | Yes |
| B | No |
| C | No |
| A and C | Yes |

Choose the correct option for P, Q, R and S.

(A) Object P- conductor
(B) Object Q- Insulator
(C) Object R- cannot tell
(D) All of the above

**15.** The below figure makes the sentence


(A) Shadows make opaque objects
(B) Objects make shadows opaque
(C) Opaque objects make shadows
(D) None of the above

❑❑❑

**ANSWER KEY**

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

INTERNATIONAL OLYMPIAD ACADEMY

**GRADE–7 & 8**

**FARADAY**

# ISO SCIENCE OLYMPIAD

## Sample Paper

### Basic:(3 Points)

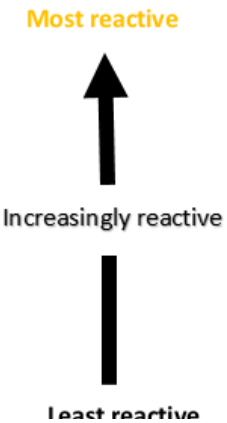
**1.** X is the medicine which is made with the help of micro-organisms mainly fungi and bacteria and used in killing or stopping the growth of the disease-causing micro-organisms. Here X can be
(A) Vaccines (B) Antibiotics (C) Antipyretic drugs (D) Analgesic

**2.** The synthetic polymer used for the coating of non-stick cookware in non-reactive polymer. This is because of
(A) The strength of carbon-Sulphur bonds (B) The strength of carbon-fluorine bonds
(C) The strength of carbon bonds (D) None of the above

**3.** Presence of _____ in a dry gaseous fuel does not contribute to its calorific value.
(A) Sulphur (B) Oxygen
(C) Carbon (D) Hydrogen

**4.** The given table shows the reactivity series of metals.Identify correct option for X, Y and Z.

| | X |
|---|---|
| Na | Sodium |
| Ca | Calcium |
| Mg | Magnesium |
| Al | Aluminum |
| Zn | Zinc |
| | Y |
| Sn | Tin |
| Pb | Lead |
| Cu | Copper |
| Mg | Mercury |
| | Z |
| Au | Gold |




| X | Y | Z |
|---|---|---|
| (A) Potassium | Iron | Silver |
| (B) Iron | Sodium | Diamond |
| (C) Silver | Iron | Sodium |
| (D) Iron | Silver | Sodium |

**5.** Which of the following force is contact force?
(A) Electric force (B) Magnetic force
(C) Gravitational force (D) Frictional force

## Foundation: (4 Points)

**6.** Which of the following incorrectly represents the difference between internal and external fertilization?

| Internal fertilization | External fertilization |
|---|---|
| (A) It is the fusion of sperm and ovum inside the body of the female | It is the fusion of sperm and ovum outside the body of the female |
| (B) It occurs in humans, hens, cows, etc. | It occurs in fish, frogs, etc. |
| (C) It does not require the presence of water | Presence of water is must for this |
| (D) It requires the presence of wind | It may or may not require the presence of wind |

**7.** Epinephrine, also called emergency hormone, is
(A) An adrenal hormone (B) Glomerulus of mammalian kidney
(C) Proximal part of nephron (D) Stomium of nephron

**8.** Mass and weight are not the same, but they are related. A book has a mass if 1.2 kilograms. What is its weight?
(A) 0.12 N (B) 0.012 N (C) 12 N (D) 1.2 N

**9.** Which of the following frequencies can be heard by a normal human being?
**(i)** 1 Hz **(ii)** 100 Hz **(iii)** 10000 Hz
(A) i and ii only (B) ii and iii only (C) i and iii only (D) i, ii and iii only

**10.** The distance from the center of earth to the center of the moon is called
(A) Orbital length of the earth (B) Orbital radius of the earth
(C) Orbital length of the moon (D) Orbital radius of the moon

## Exploration: (5 Points)

**11.** Which of the following reactions will not take place easily?
(A) K(S) + NaCl (aq) → KCl (aq) + Na(S)
(B) Mg(S) + Pb $(NO_3)_2$ (aq) → Pb (S) + Mg $(NO_3)_2$ (aq)
(C) Zn(S) + Cu (NO3)2 (aq) → Zn (NO3)2 (aq)
(D) 2$AgNO_3$ (aq) + CU (S) → 2Ag (S) + CU $(NO_3)_2$ (aq)

**12.** A 4.0 kg block of wood is pulled along a horizontal ground from rest and a force of 15 N is required to produce an acceleration of 2.0 $ms^{-2}$ on the same horizontal ground what should the magnitude of the force be?
(A) 5 N (B) 7N (C) 8 N (D) 10 N

**13.** Which pathogen causes AIDS, Gonorrhea and syphilis?

| AIDS | Gonorrhea | Syphilis |
|---|---|---|
| (A) Bacterium | Bacterium | Virus |
| (B) Bacterium | Virus | Virus |
| (C) virus | Bacterium | Bacterium |
| (D) virus | Virus | Bacterium |

**14.** A 4.0 kg block of wood is pulled along a horizontal ground from rest and a force of 15 N is required to produce an acceleration of 2.0 $ms^{-2}$.In order to pull the block of wood at a constant speed of 5.0 $ms^{-1}$ on the same horizontal ground what should the magnitude of the force be?

(A) 5 N (B) 7 N (C) 8 N (D) 10 N

**15.** An aero-plane travels at an average speed of 800 $kmh^{-1}$on an outward flight and at 600 $kmh^{-1}$on the return flight over the same distance. What is the average speed of the whole flight?

(A) 700 $ms^{-1}$ (B) 600 $ms^{-1}$ (C) 686 $kmh^{-1}$ (D) 700 $kmh^{-1}$

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**ANSWER KEY**

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

INTERNATIONAL OLYMPIAD ACADEMY

**GRADE–9 & 10**

**EDISON**

# 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

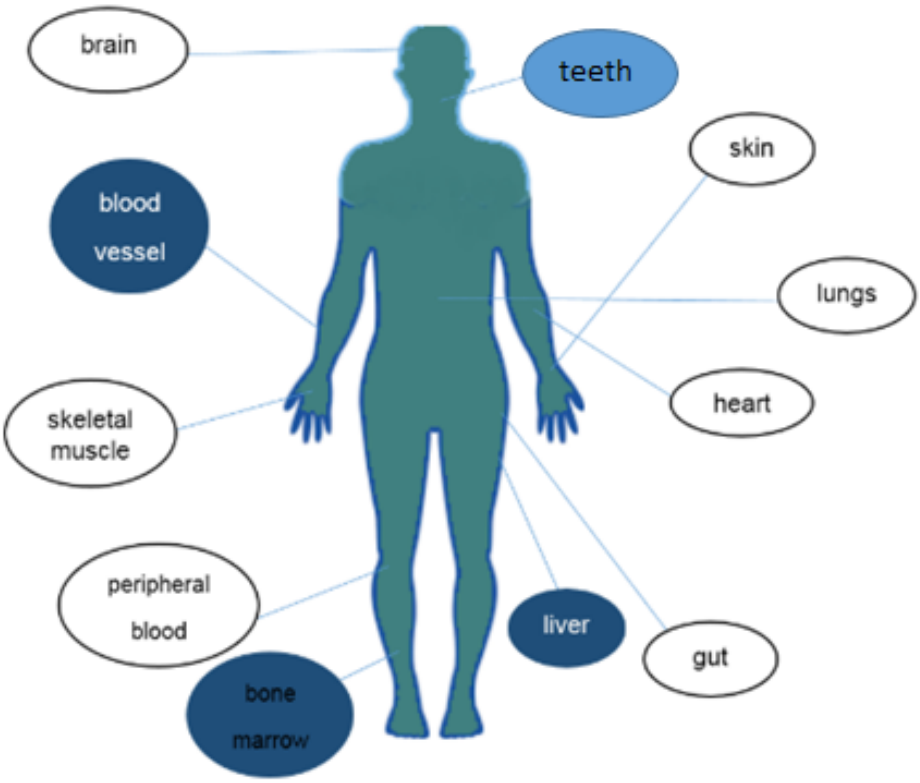
(D) Law of reciprocal proportion



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

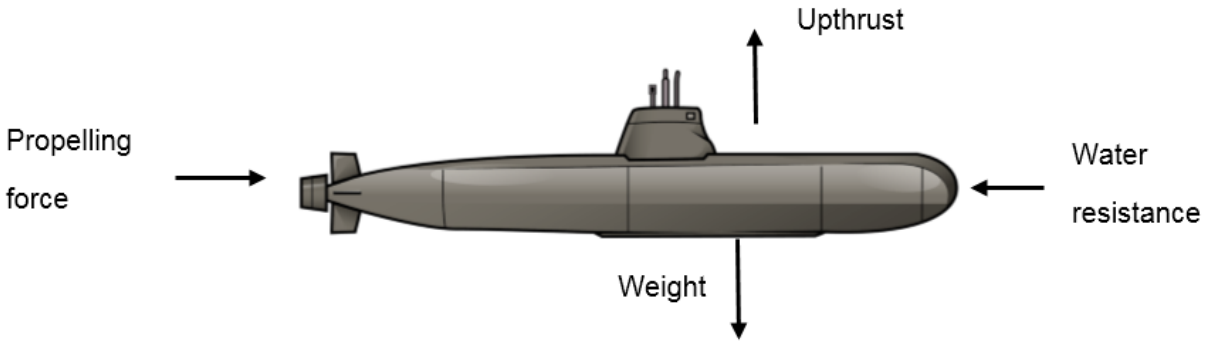
| | **Column** | **Isotopes** |
|---|---|---|
| (A) | Cl | Cl – 35 and Cl - 37 |
| (B) | O | O -11, O -12 and O – 13 |
| (C) | C | C – 12, C – 13 and C – 14 |
| (D) | H | H – 1, D – 2 and T - 3 |

**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?

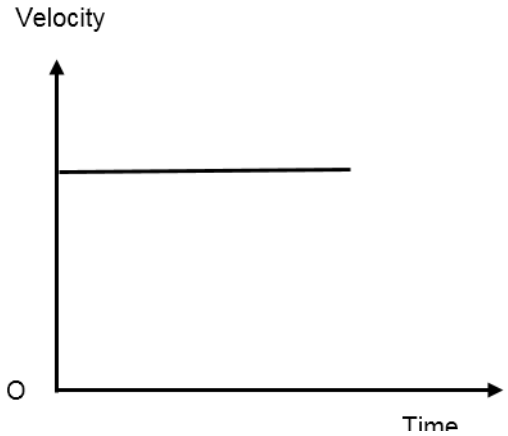



(A) The up thrust is balanced by the weight
(B) The resultant force of the four forces is zero
(C) Gravity has no effect on the submarine
(D) The water resistance balanced the propelling force

## 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




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

(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

## Exploration: (5Points)

**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?

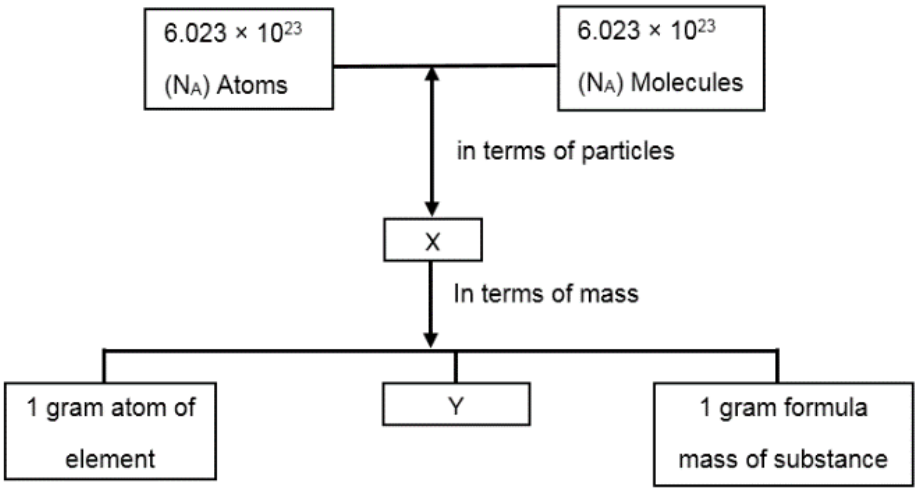
(A) When the red stuff gets warmer, it increases in volume. Since it is confined in the tube, it must go up

(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.



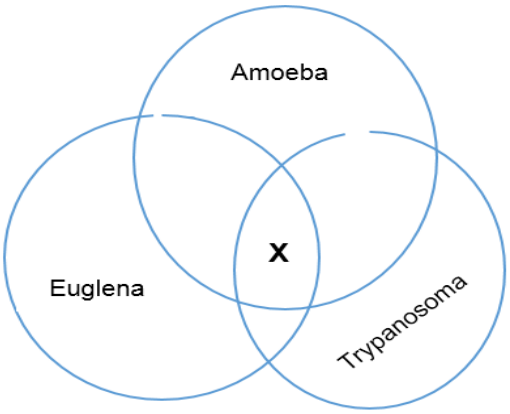

(A) X – I Mole, Y – 1 gram mole of substance

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

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

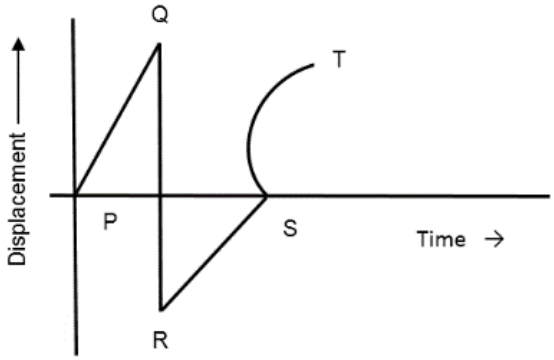
(D) X – 1.5 Mole, Y – 1.5 gram mole of substance

**13.** Study the Venn-diagram and identify X.



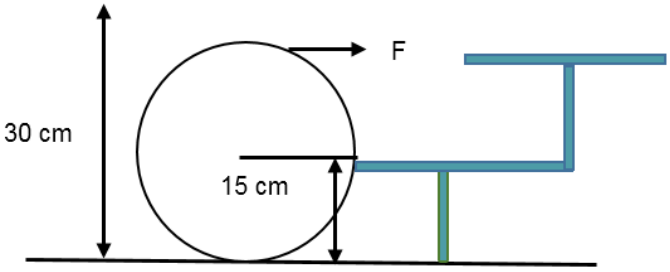

(A) Binary fission (B) Contractile vacuole (C) Holozoic nutrition (D) Multiple fission

**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

❑❑❑

| 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 | |

INTERNATIONAL OLYMPIAD ACADEMY

**GRADE–11 & 12**

**FRANKLIN**

# ISO SCIENCE OLYMPIAD

## Sample Paper

### Basic:(3Points)

**1.** In which of the following reaction is zinc hydroxide not behaving as a base?

(A) $Zn(OH)_2 + 2HCl \rightarrow ZnCl_2 + 2H_2O$

(B) $Zn(OH)_2 + 2NaOH \rightarrow Na_2Zn(OH)_4$

(C) $3ZN(OH)_2 + 2H_3PH_4 \rightarrow Zn_3(PO_4)_2 + 6H_2O$

(D) $ZN(OH)_2 + (NH_4)_2SO_4 \rightarrow ZnSO_4 + 2NH_3 + 2H_2O$

**2.** Which of the following describes correctly the difference between solutions of strong and weak acids of equal concentration?

(A) Strong acid solutions have higher pH than weak acid solution

(B) Strong acid solutions react with zinc while weak acid solution do not

(C) Strong acid solutions conduct electricity better than weak acid solutions

(D) Strong acid solutions require greater amount of alkali for neutralization compared to weak acid solutions

**3.** The elements X, Y and Z form the covalent compound of formula:

X – Y = Z

Which of the following shows the possible election structures of the atoms of X, Y and Z?

| | X | Y | Z |
|---|---|---|---|
| (A) | 1 | 2.2 | 2.5 |
| (B) | 1 | 2.4 | 2.3 |
| (C) | 2.8.7 | 2.2 | 2.3 |
| (D) | 2.8.7 | 2.4 | 2.5 |

**4.** The structure below represents the arrangement of the atoms of element X in its crystal lattice.

Which group does element X belong to in the Periodic Table?
(A) Group I
(B) Group II
(C) Group III
(D) Group IV

**5.** Choose the incorrect statement
(A) Fleming's right-hand rule is a simple rule to know the direction of induced current
(B) The right-hand thumb rule is used to find the direction of magnetic fields due to current carrying conductors
(C) The difference between the direct and alternating currents is that the direct current always flows in one direction, whereas the alternating current reverses its direction periodically
(D) In India, the AC changes direction after every 1 /50 second

## Foundation: (4 Points)

**6.** When light of wavelength x is incident on an equilateral prism, kept on its minimum deviation position, it is found that the angle of deviation equals the angle of the prism itself. The refractive index of the material of the prism for the wavelength x is

(A) $\sqrt{3}$ (B) $\sqrt{3}/2$ (C) 2 (D) $\sqrt{2}$

**7.** A concave mirror of radius of curvature 60 cm is placed at the bottom of a tank containing water up to a height of 20 cm. The mirror faces upwards with its axis vertical. Solar light falls normally on the surface of water and the image of the sun is formed. If $\mu = \frac{4}{3}$, then with the observer in air, the distance of the image from the surface of water is

(A) 30 cm (B) 10 cm (C) 7.5 cm below (D) 7.5 cm above

**8.** A wire has a resistance 16 $\Omega$. If is melted and drawn into a wire of half its length. Calculate the resistance of the new wire. What is the percentage change in its resistance?

(A) 80% (B) 72% (C) 70% (D) 75%

**9.** A battery of four cells in series, each having an e.m.f. of 1.4 V and an internal resistance of 2 $\Omega$ is to be used to change a small 2V accumulator of negligible internal resistance. What is the charging current?

(A) 0.1 A (B) 0.2 A (C) 0.3 A (D) 0.45 A

**10.** Three identical bulbs are connected in parallel with a battery. The current drawn from the battery is 6A. If one of the bulbs gets fused, what be the total current drawn from the battery?

(A) 4 A (B) 2 A (C) 6 A (D) 8 A

## Exploration: (5 Points)

**11.** The magnitude of two forces is in the ratio 3 : 5 and the angle between their direction is 60°. If their resultant force is 35 N then their magnitude will be
(A) 12 N, 20 N (B) 15 N, 25 N (C) 18 N, 30 N (D) 21 N, 28 N

**12.** A particle moves with constant acceleration for 6 seconds after starting from rest. The distance travelled during the consecutive 2 seconds interval are in the ratio
(A) 1 : 1 : 1 (B) 1 : 2 : 3 (C) 1 : 3 : 5 (D) 1 : 5 : 9

**13.** A particle moves with a constant acceleration such that in the successive time intervals $t_1$, $t_2$ and $t_3$ its average velocities are $v_1$, $v_2$ and $v_3$. The ratio of $v_1 - v_2$ and $v_2 - v_3$ is
(A) $t_1 - t_2 : t_2 + t_3$ (B) $t_1 + t_2 : t_2 + t_3$ (C) $t_1 - t_2 : t_2 - t_3$ (D) $t_1 - t_2 : t_2 - t_3$

**14.** A student can throw a ball vertically to a maximum height of 40 m. The same student can throw the ball in horizontal direction to a maximum distance of
(A) $40\sqrt{2\,n}$ (B) $20\sqrt{2\,m}$ (C) 20 m (D) 80 m

**15.** The excitation energy of an electron from second orbit to third orbit of an atom with + Ze nuclear charge is 47.2 eV. If the energy of H-atom in lowest energy state is – 13.6 eV. What will be the value of Z?
(A) 4 (B) 5 (C) 6 (D) 7

❑❑❑



**ANSWER KEY**

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