

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO



GRADE - 7

SCIENCE

SAMPLE PAPER

IOA SCIENCE OLYMPIAD - 2019 - 20

Test Booklet Series

Set - 0

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

Roll No.:

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Student's Name:

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Maximum Time: 75 Minutes

Maximum Marks: 100

INSTRUCTIONS

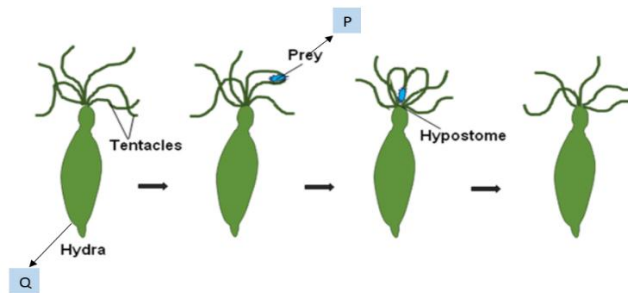
1. Please **DO NOT OPEN** the contest booklet until the proctor has given permission to start.
2. There are 40 questions in this paper. 2 points, 3 points will be awarded for each correct question in Foundation, and Exploration respectively. 1 point will be deducted for each incorrect answer, and no penalty for skipping a question.
3. All questions are compulsory. There is only ONE correct answer to each question.
4. No electronic devices capable of storing and displaying visual information are allowed during the exam.
5. Use of **calculator** is strictly prohibited in the exam.
6. Fill your **Name, Roll No., Grade and School Name** in the answer sheet.
7. To mark your choice of answers by darkening the circles in the Answer Sheet, use an HB Pencil or a **Blue/Black Ball Point Pen** only.
8. Shade your answer clearly as per the example is shown below:

CORRECT
<input type="radio"/> A <input checked="" type="radio"/> B <input type="radio"/> C <input type="radio"/> D

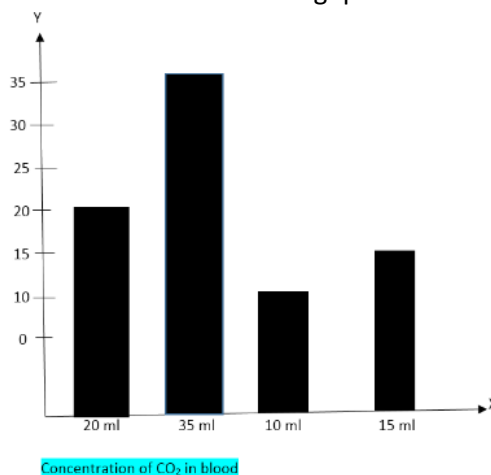
INCORRECT
<input checked="" type="radio"/> A <input checked="" type="radio"/> B <input checked="" type="radio"/> C <input checked="" type="radio"/> D

**Foundation: (2 POINTS)**

- Small intestine receives \_\_\_\_\_ to digest carbohydrate, fats and proteins.  
 (A) Secretions from liver and pancreas (B) Secretions from bile duct and saliva  
 (C) Secretions from saliva and gall bladder (D) Secretions from small intestine and liver
- One of the features which does not hold true for saprophytic plants is that  
 (A) They are green in colour (B) These plants are commonly seen during rain  
 (C) Yeast shows saprophytic mode of nutrition (D) These plants cannot synthesize their own food
- Refer the given figure, what does it represents?



- Symbiotic mode of nutrition as both the organisms P and Q are being benefited in the process
  - Predatory mode of nutrition as organism P is being eaten by the organism Q
  - Autotrophic mode of nutrition as the organism Q is obtaining food for itself
  - Parasitic mode of nutrition as the organism P is being harmed by organism Q
- When we breathe in air, we breathe in other gases also which are not required by our body. How does the body deals with these gases?  
 (A) These gases are exhaled out instantly, letting in only the useful gases  
 (B) These gases are filtered by tiny hairs present in nose  
 (C) These gases are not absorbed by lungs and it exhale them out  
 (D) These gases are converted into oxygen by lungs
  - Read the bar graph shown below and answer the following question.

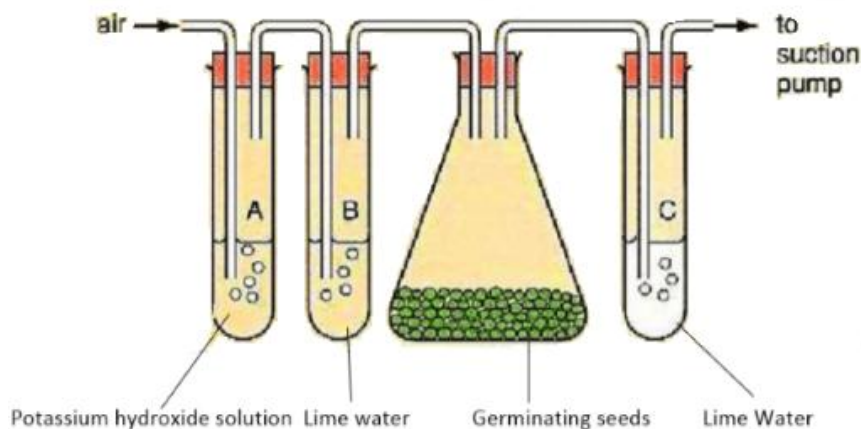


- With the increase in carbon dioxide in blood the rate of respiration also increases
- With the decrease in carbon dioxide in blood the rate of respiration also increases
- Rate of respiration is independent of the concentration of carbon dioxide in blood
- Concentration of carbon dioxide is variable in the blood

6. The chemical equation for aerobic cellular respiration is

- (A)  $C_6H_{12}O_6 + O_2 \longrightarrow CO_2 + H_2O + ATP$
- (B)  $C_6H_{12}O_6 + H_2O \longrightarrow CO_2 + O_2 + ATP$
- (C)  $C_6H_{12}O_6 + \text{Lactic acid} \longrightarrow CO_2 + H_2O + ATP$
- (D)  $C_6H_{12}O_6 \longrightarrow \text{Lactic acid} + H_2O + ATP$

7. Tina set up an experiment as shown in the given figure. What will be her observation after sometimes?

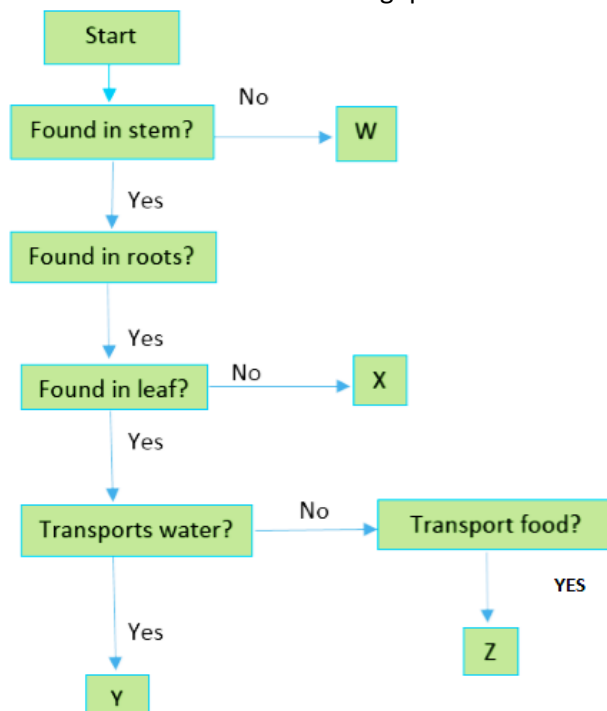


- (A) Lime water in test tube Q turns milky
- (B) Lime water in test tube Q does not turns milky
- (C) Lime water in test tube R turns milky
- (D) Potassium hydroxide solution in test tube P turns blue

8. What is the correct route for blood to travel from legs to the brain in the human body?

- (A) Leg  $\longrightarrow$  Lungs  $\longrightarrow$  Heart  $\longrightarrow$  Lungs  $\longrightarrow$  Brain
- (B) Leg  $\longrightarrow$  Heart  $\longrightarrow$  Lungs  $\longrightarrow$  Heart  $\longrightarrow$  Brain
- (C) Legs  $\longrightarrow$  Arms  $\longrightarrow$  Lungs  $\longrightarrow$  Liver  $\longrightarrow$  Brain
- (D) Legs  $\longrightarrow$  Kidney  $\longrightarrow$  Lungs  $\longrightarrow$  Heart  $\longrightarrow$  Brain

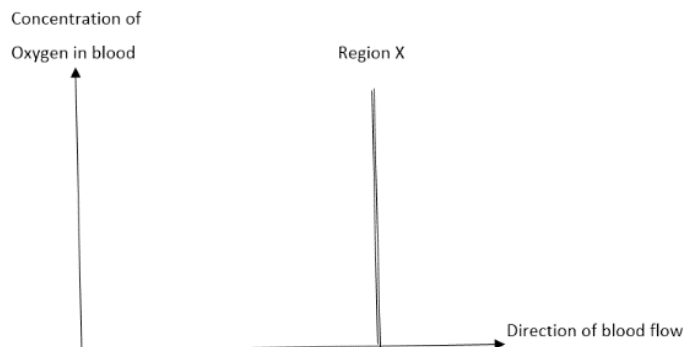
9. Read the flow chart shown below and answer the following question.



What could W represent in the above flowchart?

- (A) Xylem
- (B) Phloem
- (C) Root hair
- (D) Stomata

10. The given graph shows the change in concentration of oxygen when the blood flows in the blood vessels.



What could most likely take place in region X which causes the concentration of oxygen to increase abruptly?

- (A) Red blood cells in the blood pick up oxygen from the alveoli when it reaches region X  
 (B) The body cells in region X return the excess oxygen to the blood  
 (C) The body cells in region X carry out chemical reactions which produce large quantity of oxygen  
 (D) Haemoglobin in the red blood cells lose the ability to carry oxygen abruptly in region X
11. What is true about a cucumber flower?  
 (A) Neither filament nor stigma (B) Neither anther nor stigma  
 (C) Either male or female reproductive parts (D) Both male and female reproductive parts

12. Which of the following is not one of the applications of plane mirrors?

- (A) Real view mirror of a car (B) Periscopes  
 (C) As decorative purpose to make a room appear bigger (D) Blind corner mirror

13. The given table lists some plants and their reproductive structures. Choose correct option to be placed at X and Y?

Plants	Reproductive structures
X	Seeds
Moss	Spores
Onion	Y

- (A) X - Pineapple Y - Root  
 (B) X - Bean plants Y - Underground stem  
 (C) X - Drumstick Y - Underground stem  
 (D) X - Bryophyllum Y - Leaves
14. Two rods P and Q are placed in boiling water and lying on the table respectively. Rod P does not feel hot but rod Q feels cool when touched. Rods P and Q are made of \_\_\_\_\_ material.  
 (A) Metal and plastic respectively (B) Glass and ceramic respectively  
 (C) Glass and plastic respectively (D) Glass and metal respectively

15. The balloon rises, when the air inside is heated. It is because



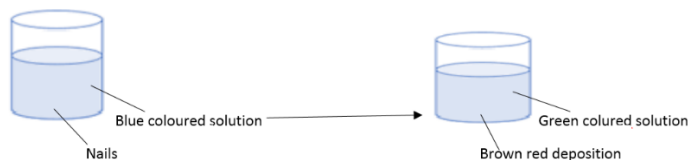
- (A) The hot air inside the balloon is attracted to the sun  
 (B) The wind blows the balloon upwards  
 (C) The hot air is less dense than cold air  
 (D) Outside air is less dense than the hot air inside the balloon

16. The inner and outer surface of the flask is coated with plastic and steel. Why heat does not appear at the outer surface of the flask. Is flask containing hot liquid?
- (A) Due to conduction between inner and outer surface
  - (B) Due to insulation between inner and outer surface
  - (C) Due to radiation between inner and outer surface
  - (D) Due to convection between inner and outer surface
17. When the moon comes in between the sun and the earth in a straight line, then a solar eclipse is formed. This formation of a solar eclipse is based on the concept of the \_\_\_\_ .
- (A) Formation of a shadow of the earth on the moon
  - (B) Formation of a shadow of the moon on the earth
  - (C) Reflection of light by the earth
  - (D) Reflection of light by the moon
18. The pain because of the sting of an ant can be reduced by rubbing moist baking soda. This is because
- (A) Sting of the ants contain formic acid which is neutralised by base that is moist baking soda
  - (B) Sting of the ants contain acetic acid which is neutralised by base that is moist baking soda
  - (C) Sting of the ants contain magnesium hydroxide which is neutralised by base that is moist baking soda
  - (D) Sting of the ants contain calcium carbonate which is neutralised by base that is moist baking soda
19.  $\text{NaHCO}_3 \longrightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O} + \text{CO}_2$
- Which of the following statement holds true for the above shown chemical equation?
- (A) When a pinch of baking soda is added to vinegar, the gas evolved is carbon dioxide
  - (B) When a pinch of sodium carbonate is added to vinegar, the gas evolved is carbon dioxide
  - (C) When a pinch of vinegar is added to baking soda, the gas evolved is carbon dioxide
  - (D) When a pinch of baking soda is added to vinegar, the gas evolved is oxygen
20. What is the use of cooking oil in frying a sausage in terms of heat transfer?
- (A) To increase rate of heat transfer to the sausage via radiation
  - (B) To increase rate of heat transfer to the sausage via convection
  - (C) To increase rate of heat transfer to the sausage via conduction
  - (D) To increase rate of heat transfer to the sausage via evaporation

**Exploration: (3 POINTS)**

21. Why crystallization is a better technique than evaporation for recovering sugar from sugar solution?
- (A) Some solids like sugar decompose or get charred on heating during evaporation
  - (B) Some solids like sugar associates together on heating during evaporation
  - (C) Some solids like sugar disappear on heating during evaporation
  - (D) All of the above

22. Study the below shown diagram carefully and answer the following question.



Which of the following reaction explains the above change correctly?

- (A)  $\text{ZnSO}_4 + \text{Cu} \longrightarrow \text{CuSO}_4 + \text{Zn}$       (B)  $\text{CuSO}_4 + \text{Fe} \longrightarrow \text{FeSO}_4 + \text{Cu}$   
 (C)  $\text{FeSO}_4 + \text{Cu} \longrightarrow \text{CuSO}_4 + \text{Fe}$       (D)  $\text{CuSO}_4 + \text{Zn} \longrightarrow \text{ZnSO}_4 + \text{Zn}$

23. What is the purpose of long beak of the bird shown in the given figure?



- (A) To hold weak branches      (B) To enable reach the fruits on weak branches  
 (C) Give attractive look      (D) Camouflage itself from the surroundings

24. Animal shown in figure I differs from the animal shown in figure II in presence of



- (A) Homeothermy      (B) Four-chambered heart      (C) Tracheae      (D) Diaphragm

25. Which of the following is incorrect about the changes occurring in climatic condition?

- (A) Around 15% of the carbon released in the environment is due to deforestation and change in use of land  
 (B) The global temperature on an average has increased by 0.6 to 1°C till the 20<sup>th</sup> century  
 (C) Climate change enhances the spread of pests that causes life threatening diseases like dengue, malaria, Lyme disease etc.  
 (D) Due to the greenhouse effect, the average temperature of the earth is 20°C rather than 10°C without the Greenhouse effect

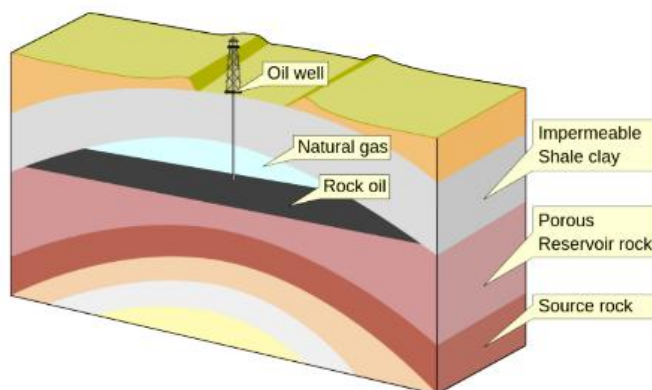
26. The center of the cyclone is a calm area called the eye of the storm, which varies from \_\_\_\_\_ in diameter.

- (A) 300 – 400 km      (B) 3 – 10 km      (C) 10 – 30 km      (D) 300 – 400 m

27. Why lightning rods are made from copper?

- (A) Because copper rods conduct electricity but does not rust easily  
 (B) Because copper rods does not conduct electricity and does not rust  
 (C) Because copper rods conduct electricity and has a low density  
 (D) Because copper rods does conduct electricity and has a low density

28. What are the safety measures taken by the authorities to minimize the damage by cyclones in coastal areas?
- (A) Cyclone forecast and warning service with slow communication of warnings
  - (B) Destruction of cyclone shelters in cyclone prone areas
  - (C) Arrangements to move people to safer places with slow pace
  - (D) Cyclone forecast and warning service with rapid communication of warnings, arrangements to move people fast to safer place
29. The volume of water during solidification
- (A) Decreases on decreasing the temperature
  - (B) Increases on decreasing the temperature
  - (C) Increases on increasing the temperature
  - (D) Remains same
30. Why are food chains usually limited to only four or five trophic levels?
- (A) There is insufficient biomass to support higher trophic levels
  - (B) There are insufficient numbers of organisms to support higher trophic levels
  - (C) There is significant loss of energy at each transfer in a food chain
  - (D) There are very few types of top carnivores
31. Which of the following is correct about the figure shown here?



- (A) It is an anticline trap
  - (B) It is a fold structure with an arch of non-porous rock overlying reservoir reservoir rock
  - (C) It provides a trap in which oil, gas or water may accumulated
  - (D) All of the above
32. Which of the following option is correct of the quartz crystals?
- (A) It emits vibrations of fixed frequency
  - (B) It measures time up to milliseconds
  - (C) Quartz crystal clock is more accurate than the clocks of earlier time
  - (D) All of these
33. Which of the following is not consider to be an acceleration \_\_\_\_\_.
- (A) A bus changing its speed from 30 m/s to 50 m/s
  - (B) A car traveling around a bend at 40 km/h
  - (C) A plane coming down to land at a speed of 180 m/s
  - (D) A boy traveling at 15 m/s over 100 metres

34. Boojho walks to his school which is at a distance of 3 km from his home in 30 minutes. On reaching he finds that the school is closed and comes back by a bicycle with his friend and reaches home in 20 minutes. His average speed in km/h is  
(A) 8.3                      (B) 7.2                      (C) 5                      (D) 3.6
35. The iron is use only for making electromagnet; not nickel, steel, cobalt. It is because of  
(A) Iron is cheep and easily available  
(B) Iron is a good conductor of electricity  
(C) When current is switched off in the coil of an electromagnet made of iron, iron loses all is magnetism  
(D) None of these
36. Why is electrical energy usually transmitted at high voltage in transmission cables?  
(A) To make the resistance of the transmission cables as small as possible  
(B) To make the transmission cables safe to handle  
(C) To minimize the loss of energy in the transmission cables  
(D) To make the current in the transmission cables as large as possible
37. A hair dryer contains a heater. The heater has two coils connected in parallel. Which of the following statements is correct?  
(A) A current of 2 A flows through each of the coils  
(B) There is the same voltage across both coils  
(C) The total resistance of the coils is the sum of their separate resistances  
(D) The total voltage of the supply is shared between the coils
38. Rainbow is produced in the sky due to the sun light. Which of the following is involved for the formation of rainbow in the sky?  
(A) Dispersion and total internal reflection of sun light  
(B) Diffusion of the sunlight  
(C) Due to only refraction of sunlight  
(D) All of these
39. How do opaque materials differ from transparent materials?  
(A) Most light is transmitted through transparent materials whereas opaque materials mostly reflect and absorb light  
(B) Light reflected from opaque materials gives rise to color: transparent materials are largely colorless  
(C) Both A and B  
(D) None of these
40. Which of the following is defined as refractive index of a medium?  
(A) The ratio of the speed of light in vacuum to the speed of light in air  
(B) The ratio of the speed of light in air to the speed of light in vacuum  
(C) The ratio of the speed of light in vacuum to the speed of light in medium  
(D) The ratio of the speed of light in medium to the speed of light in vacuum