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# Preparatory Material

## ICATS SCIENCE CONTEST

### Grade 5-6



INTERNATIONAL  
**CATS CONTESTS**  
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# ICATS SCIENCE

Contest 2017

**JUNIORS GRADE 5 & 6**



## INTERNATIONAL CATS CONTESTS

COMPETENCE & APTITUDE TESTING SERVICES



# **ICATS SCIENCE CONTEST 2017**

## **JUNIORS (GRADE 5 & 6)**

**TIME ALLOWED : 90 MINUTES**

**MAXIMUM MARKS : 90**

**TOTAL QUESTIONS : 30 MCQS**

### **INSTRUCTIONS**

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3. WRITE YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET (ANSWER SHEET) ONLY.
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**Q1.** The following is a list of several human body systems.

- Circulatory system
- Muscular system
- Reproductive system
- Respiratory system

Which two systems in the list use oxygen and release carbon dioxide when they work together?

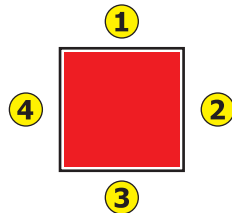
**A** Circulatory and muscular

**B** Muscular and reproductive

**C** Circulatory and respiratory

**D** Respiratory and reproductive

**Q2.** Four students stand facing a box. The diagram below shows an overhead view of the box. The numbered circles represent the positions of the students.



What do the students need to do to slide the box to the northeast?

**A** Students 1 and 2 push, and Students 3 and 4 pull.

**B** Students 1 and 4 push, and Students 2 and 3 pull.

**C** Students 2 and 3 push, and Students 1 and 4 pull.

**D** Students 3 and 4 push, and Students 1 and 2 pull.

**Q3.** Ahmad is trying to decide which pan to use for cooking. He wants his food to cook quickly and evenly. He has the following types of pans from which to choose:

- Aluminum
- Copper
- Glass
- Plastic

Which material should Ahmad use for cooking?

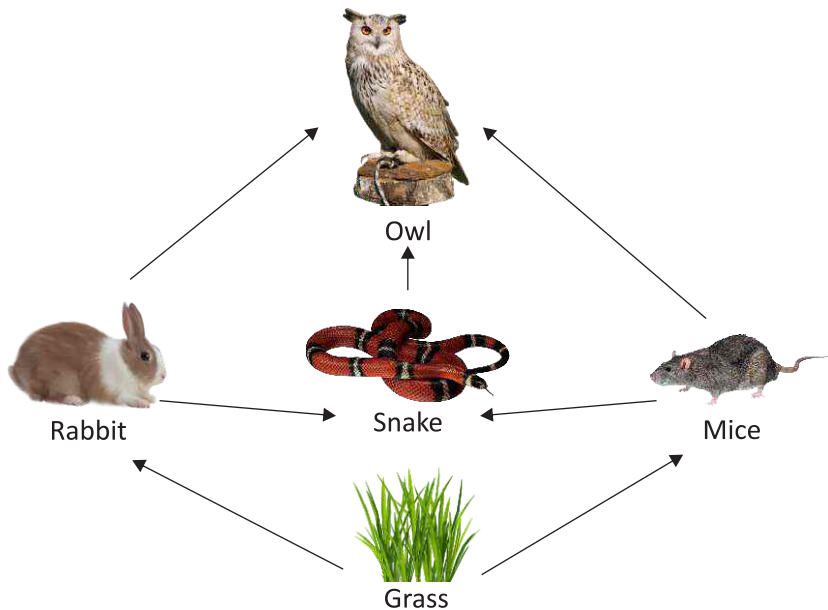
**A** Aluminum, because it is a good electrical conductor

**B** Copper, because it is a good thermal conductor

**C** Glass, because it is a good electrical insulator

**D** Plastic, because it is a good thermal insulator

**Q4.** The following food web shows different organisms in a field.



**Which of the following will happen if animal control removes all of the snakes from the field?**

- A** There will be more mice and rabbits and less grass.
- B** There will be fewer mice and rabbits and more owls.
- C** There will be fewer mice and more rabbits and grass.
- D** There will be more owls, mice, and grass and fewer rabbits.

**Q5.** The following pictures show examples of potential energy.

**Which of the following is an example of chemical potential energy?**



The trampoline



The bow and arrow



The child on the swing



Batteries in a flashlight

**Q6.** A student hiking in a rocky area on a mountain notices that wide, deep cracks have formed in some of the large rocks. Some of the cracks are so large that the rocks have broken apart. Which process most likely caused these rocks to crack and break?

**A** Erosion by wind

**B** Water freezing and thawing

**C** Erosion by fast-moving water

**D** Sediments being deposited

**Q7.** In six months, how far will Earth have gone in its orbit around the sun compared to how far the moon has gone in its orbit around Earth?

**A**

- Earth: completed one orbit of the sun
- Moon: completed one orbit of Earth

**B**

- Earth: completed six orbits of the sun
- Moon: completed twelve orbits of Earth

**C**

- Earth: completed half of one orbit of the sun
- Moon: completed six orbits of Earth

**D**

- Earth: completed a third of one orbit of the sun
- Moon: completed three orbits of Earth

**Q8.** Which organism produces oxygen for other organisms?

**A** a fish

**B** a water lily

**C** a blue bird

**D** a snail

**Q9.** Seeds that remain inactive until the right conditions of light, water, and soil are present are called —

**A** pollen

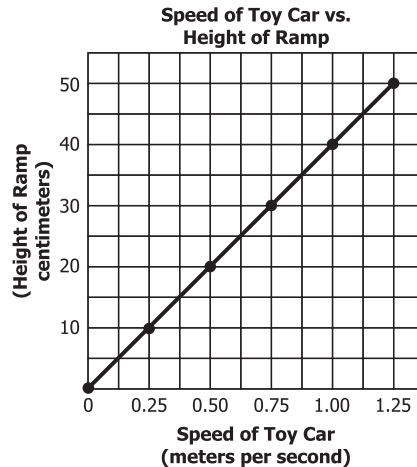
**B** dormant

**C** flowers

**D** recycled



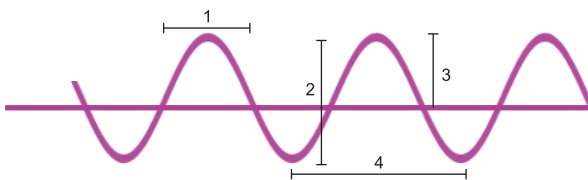
- Q10.** The following graph shows the relationship between the height of a ramp and the speed of a toy car released from the top of the ramp.



Which statement describes the pattern of the data on the graph?

- A** The faster the speed, the farther the toy car will travel off of the ramp.  
**B** The speed remains the same even if the height of the ramp is increased.  
**C** The increase in height of the ramp causes the toy car to decrease speed.  
**D** The higher the ramp, the faster the speed of the toy car.

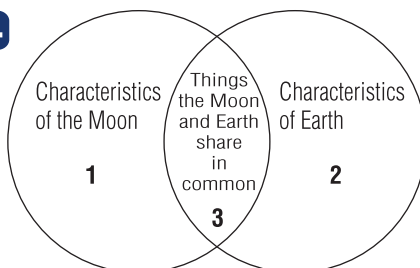
- Q11.** Look at this wave pattern.



Which measurement line represents the amplitude of the wave?

- A** 1      **B** 2  
**C** 3      **D** 4

- Q12.**



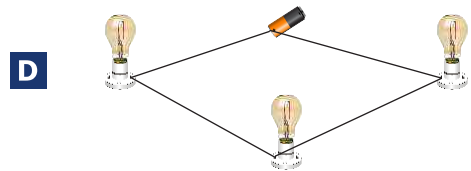
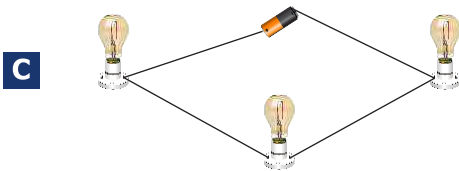
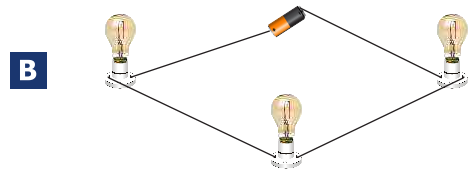
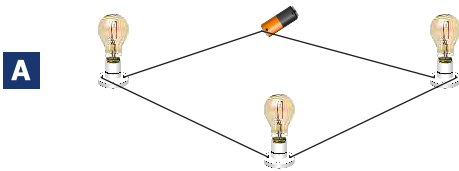
Which of these would fit best in area 3 of this Venn diagram?

- A** Rocky surface  
**B** Active volcanoes  
**C** Liquid water present  
**D** Oxygen in atmosphere

**Q13.** A student made observations of four rock samples. Which of these observations most likely describes a sedimentary rock?

- A** Sample 1 has bands of light and dark crystals.
- B** Sample 2 has pink, grey, and white crystals grown together.
- C** Sample 3 is made up of one huge, pale pink crystal.
- D** Sample 4 is made up of layers of sand grains cemented together.

**Q14.** A class prepared some electric circuits using a battery, connecting wires, and three light bulbs. Which of these circuits can make the three bulbs light?



**Q15.** The flower's stem appears larger under water because the water —



- A** absorbs light
- B** produces light
- C** repels light
- D** refracts light

**Q16.**

The picture shows a sprouting bean plant. The leaf produced will help the plant by —

- A** absorbing water from the air for nourishment
- B** using sunlight for energy in food production
- C** reproducing more bean plants for survival of the species
- D** adding support for the plant as it grows taller

**Q17. Which of these best describes a tornado?**

- A** A winter storm that produces frozen precipitation
- B** A rotating funnel-shaped cloud with strong winds and thunderstorms
- C** A severe weather condition with low temperatures and blowing snow
- D** A storm that forms over warm ocean water and has extremely strong winds

**Q18.** The electrician in this picture is wearing rubber gloves for protection. The purpose of the rubber gloves is to —



- A** keep the electrician dry
- B** create an electrical circuit
- C** produce electricity
- D** insulate the electrician

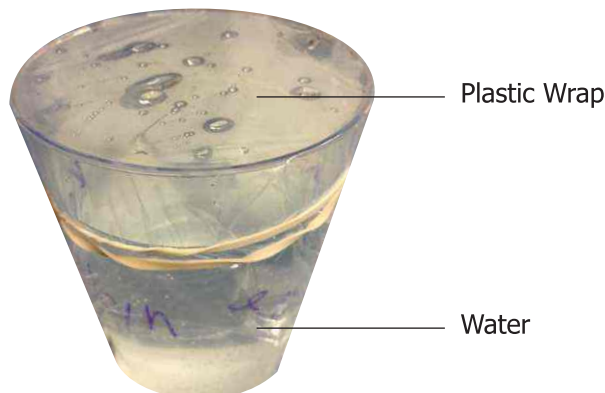
**Q19.** Some students make a model to show one of the first steps in the formation of sedimentary rock. The students pour 2 centimeters of light-colored sand into a clear plastic box. Then they add 1 centimeter of gravel. Finally they pour 2 centimeters of dark-colored sand on top of the gravel. Which characteristic of sedimentary rock does this model best show?

- A** Sedimentary rock is made of layers.
  - B** Sedimentary rock is cemented bits of rock.
  - C** Sedimentary rock is often limestone.
  - D** Sedimentary rock is common in Texas.
- 

**Q20.** Granite is a hard material and forms from cooling magma. Granite is a type of —

- A** lava stone
  - B** igneous rock
  - C** volcanic dust
  - D** sedimentary rock
- 

**Q21.** A student makes a model of the water cycle by using a cup, some water, and plastic wrap. After the student places the model near a sunny window, moisture forms on the inside of the plastic wrap.

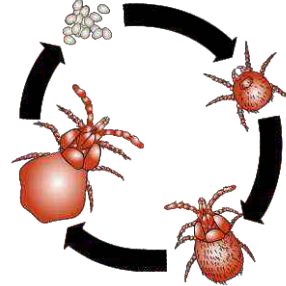
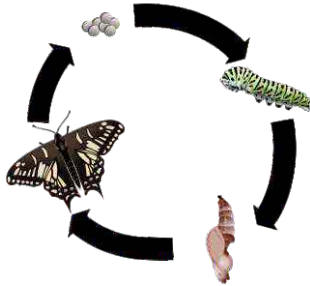


What change is the student most likely observing in this model?

- A** Freezing
- B** Condensation
- C** The warming of air
- D** The formation of clouds



**Q22.** The life cycles of a butterfly and a chigger are shown below.

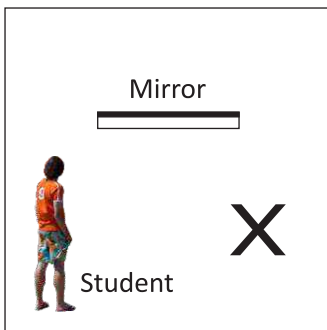


**How is the life cycle of chiggers different from the life cycle of butterflies?**

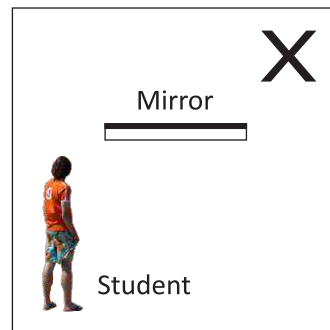
- A** Chigger larvae have legs.
- B** Chiggers have a nymph phase.
- C** Chiggers go through metamorphosis.
- D** Chigger larvae hatch from eggs.

**Q23.** A student looks into a mirror and sees an image of an object. Which diagram shows an X where the object is most likely located?

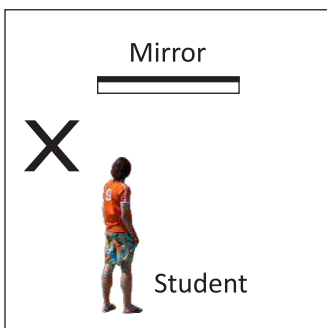
**A**



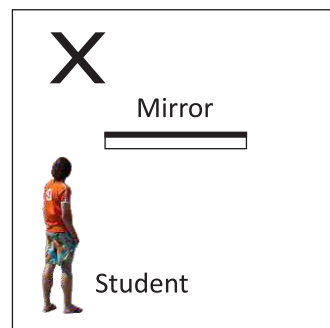
**B**



**C**




**D**



**Q24.** A student draws diagrams of her house and the location of the sun in the sky. Which diagram below does not correctly represent the location of the sun at the time indicated?


**A**



West East

12:05 P.M.


**B**



West East

08:45 A.M.


**C**



West East

10:15 A.M.

**D**

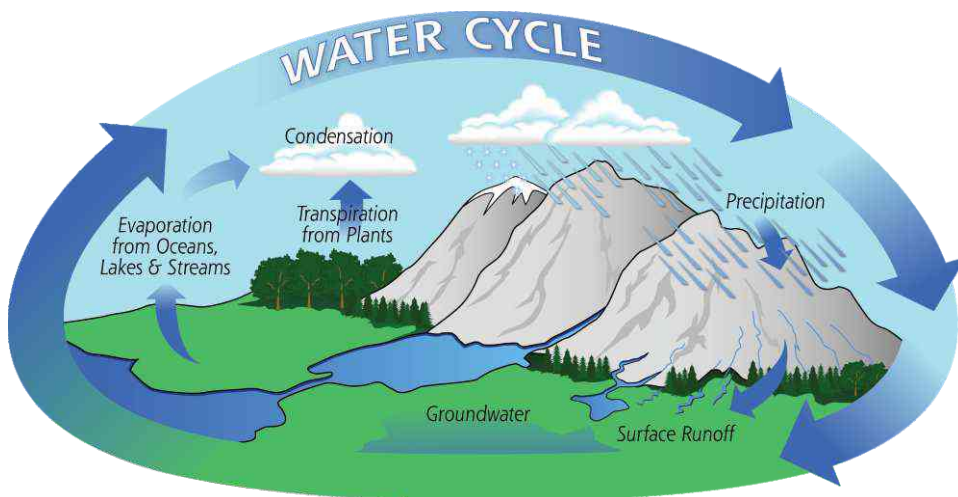


West East

07:00 P.M.

---

**Q25.** During which part of this cycle does it snow?



**A** Evaporation

**B** Condensation

**C** Precipitation

**D** Runoff

**Q26.** A student classifies the objects shown based on their physical properties.

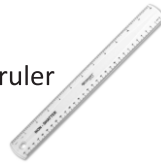


Penny



Cotton ball

Plastic ruler



Metal paper clip



Eraser



Key



Iron nail



Rubber band

Which property cannot be used to classify these objects into more than one group?

**A** Magnetism

**B** Mass

**C** Electrical conductivity

**D** Solubility in water

**Q27.** Resources can be classified as renewable or nonrenewable. Which of these resources is classified in the same category as coal?

**A** Wood

**B** Wind

**C** Corn oil

**D** Petroleum

**Q28.** A wide U-shaped valley is shown in the photograph below.



This valley was most likely formed by —

**A** flash flooding

**B** a glacier

**C** a hurricane

**D** melting snow

- Q29.** There is concern about the effect that overfishing is having on the population of tuna, swordfish, and other large fish in the ocean. An organization has come up with the following four suggestions on how to manage the fish population.

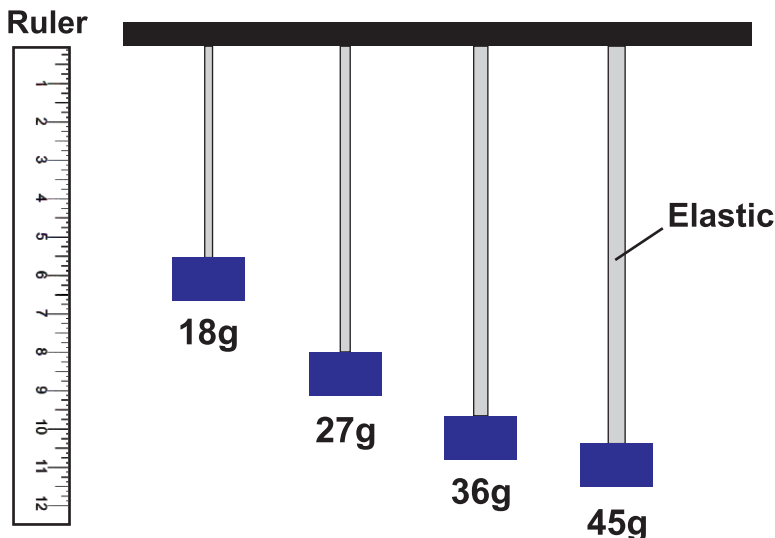
**Suggestions for Preserving Fish Population**

Suggestion	Description
Create fish farms	Build artificial environments inland to produce fish for food
Control fishing	Set limits as to the amount of fish that can be caught and the time of year fishing is done
Increase the population of the fish	Bring in fish from other places to boost the population
Increase the amount of food for the fish	Add nutrients to the water to attract more fish to the area

**Which suggestion would conserve the fish in the ocean?**

- A** Creating fish farms would increase the number of fish worldwide.
- B** Controlling fishing would help increase the existing fish population.
- C** Introducing new fish would increase that particular fish population.
- D** Increasing the amount of food would encourage fish migration.

- Q30.** A student designs an experiment to test the effect of the width of a piece of elastic on the elastic's ability to stretch. The student selects four pieces of elastic with different widths but the same length. The student then attaches blocks with different masses to the pieces of elastic. The results of the student's experiment are shown below





**What should the student do to improve this experiment?**

- A** Use blocks of equal mass on the four pieces of elastic
- B** Use blocks with enough mass to cause the four pieces of elastic to break
- C** Use more than four pieces of elastic and four blocks
- D** Use four pieces of elastic with different lengths but the same width



## INSTRUCTIONS

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions, Grade 3-4 will fill in circles of 25 questions and Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Grade and School written below, the same would appear at your certificate.
- Use of lead pencil is not allowed.
- Use only Black / Blue ink to fill in the circles.

# ICATS Science Contest 2017 Grade 5-6

Choose only ONE of the FOUR proposed answers (A, B, C or D) and fill in the circle with your answer.

Example of correctly filled table of answers.

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

Correct Filling Answer "C"

(A) (B) (X) (D)

wrong filling

(A) (B) (✓) (D)

wrong filling

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

wrong filling

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

wrong filling

Q Answer

1 (A) (B) (C) (D)  
2 (A) (B) (C) (D)  
3 (A) (B) (C) (D)  
4 (A) (B) (C) (D)  
5 (A) (B) (C) (D)  
6 (A) (B) (C) (D)  
7 (A) (B) (C) (D)  
8 (A) (B) (C) (D)  
9 (A) (B) (C) (D)  
10 (A) (B) (C) (D)

Q Answer

11 (A) (B) (C) (D)  
12 (A) (B) (C) (D)  
13 (A) (B) (C) (D)  
14 (A) (B) (C) (D)  
15 (A) (B) (C) (D)  
16 (A) (B) (C) (D)  
17 (A) (B) (C) (D)  
18 (A) (B) (C) (D)  
19 (A) (B) (C) (D)  
20 (A) (B) (C) (D)

Q Answer

21 (A) (B) (C) (D)  
22 (A) (B) (C) (D)  
23 (A) (B) (C) (D)  
24 (A) (B) (C) (D)  
25 (A) (B) (C) (D)  
26 (A) (B) (C) (D)  
27 (A) (B) (C) (D)  
28 (A) (B) (C) (D)  
29 (A) (B) (C) (D)  
30 (A) (B) (C) (D)



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COMPETENCE & APTITUDE TESTING SERVICES



**GRADE 5 & 6 (JUNIORS)**

*Time Allowed: 90 Mins.*

*Maximum Marks: 90*



**ICATS**  
**SCIENCE** **Contest 2018**  
**QUESTION BOOKLET**

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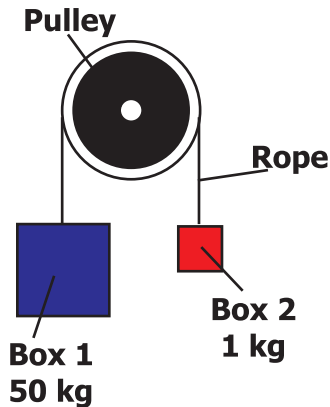
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- Q1.** This diagram shows two boxes hanging over a pulley. The boxes are fastened to the opposite ends of the same piece of rope. The rope does not stretch or break.



What will happen in this situation?

- A** Box 1 will move up, and Box 2 will move down.
  - B** Box 1 will move down, and Box 2 will move up.
  - C** Both boxes will not move.
  - D** Both boxes will move down.
- 

- Q2.** A student glued two pieces of wood together. The student needs to hold the two pieces of wood together tightly until the glue is fully dry the next day. Which of the following tools is best for holding the two pieces of wood together until the glue is dry?



**Q3.** An atmospheric condition is diagrammed below.

solar energy → warm air rises → air cools, then sinks → air currents

This process results in the formation of

**A** clouds

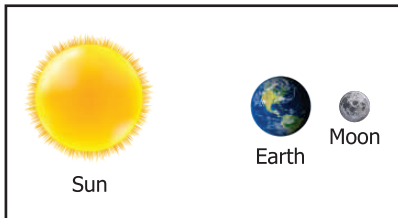
**B** rain

**C** wind

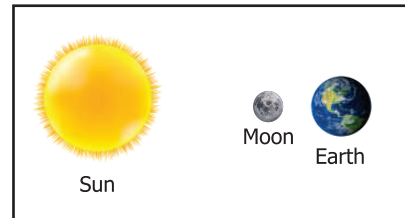
**D** None of these

**Q4.** Which model best shows a solar eclipse?

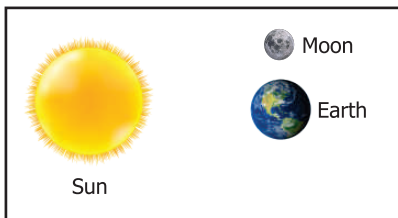
**A**



**B**



**C**



**D**

All of the above

(Not drawn to scale)

- Q5.** Four objects were dropped from a height of 10 meters. The order in which they reached the ground is shown in the table given below:

**Falling Objects**

Object	Order
Feather	3rd
Golf Ball	1st
Sheet of Notebook Paper	4th
Foam Ball	2nd

The sheet of paper took the longest time to reach the ground most likely because

- A** it has the most mass. **B** it has the most surface area.  
**C** it has the least weight. **D** it has the maximum weight.
- 

- Q6.** A bottle company noticed that bottle caps were being put on bottles with too much force, resulting in broken bottles. Engineers changed the capping device so it would use less force. Which step should the engineers take before the capping device is considered fixed?

- A** observe the number of broken bottles after the device has been adjusted  
**B** increase the size of the bottle caps used in the capping process  
**C** replace the bottle caps with different caps that cover a larger bottle opening  
**D** all of the above

- Q7.** Water and ketchup are each poured onto a tray from two separate bottles. The tables below show the amount of time it takes each liquid to flow from the top to the bottom of a tray.

Water Data

Trial No.	Time (sec.)
1	2
2	3
3	2

Ketchup Data

Trial No.	Time (sec.)
1	35
2	35
3	40

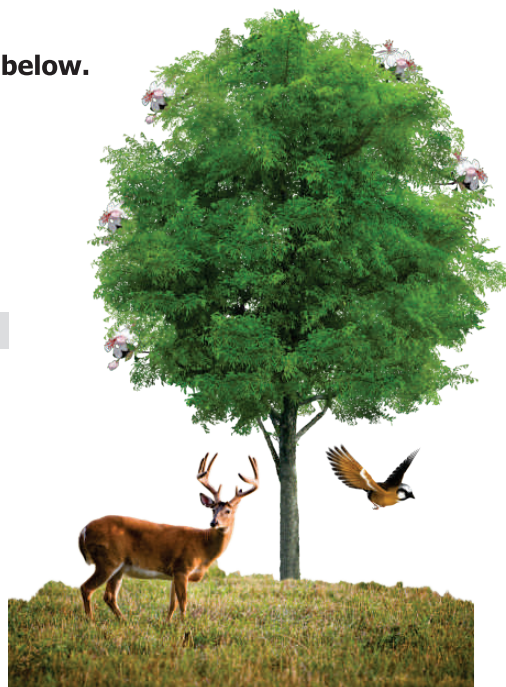
What conclusion is best supported by the data in the tables?

- A** Liquids with sugar crystals travel to the bottom of a tray faster.
- B** Thicker liquids take less time to travel to the bottom of a tray.
- C** Thicker liquids take longer to travel to the bottom of a tray.
- D** Thicker liquids do not take longer to travel to the bottom of a tray.

- Q8.** Some organisms are shown in the drawing below.

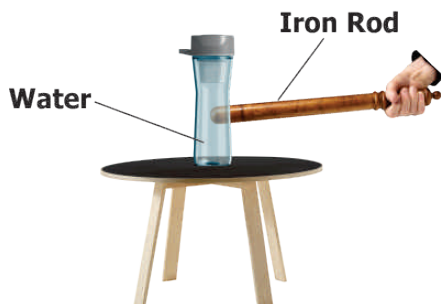
Which statement best compares how these organisms obtain energy?

- A** The deer, flower, bird, grass, and tree must eat food.
- B** The deer and bird make food, and the tree, grass, and flower must eat food.
- C** The deer, flower, bird, grass, and tree must make food.
- D** The tree, grass, and flower make food, and the deer and bird must eat food.



Study the investigation given below and answer questions 9 and 10.

- Q9.** A student pours water into a glass bottle. Next, the student gently taps the outside of the bottle with an iron rod.



Which idea is most likely being investigated by the student?

- |  |   |
|--|---|
| <b>A</b> energy transfer through materials | <b>B</b> heat conduction through materials  |
| <b>C</b> magnetic properties of materials  | <b>D</b> reflective properties of materials |
- 

- Q10.** Which observations best support the answer to question 9?

- |   |
|---|
| <b>A</b> The temperature of the water remains the same after the student taps the bottle with the iron rod. The iron rod and the glass bottle are made of different materials.      |
| <b>B</b> A sound is produced when the student taps the bottle with the iron rod. The temperature of the water remains the same after the student taps the bottle with the iron rod. |
| <b>C</b> A sound is produced when the student taps the bottle with the iron rod. Waves are produced in the water, showing vibration.  |
| <b>D</b> Waves are produced in the water, showing vibration. The iron rod and the glass bottle are made of different materials.   |

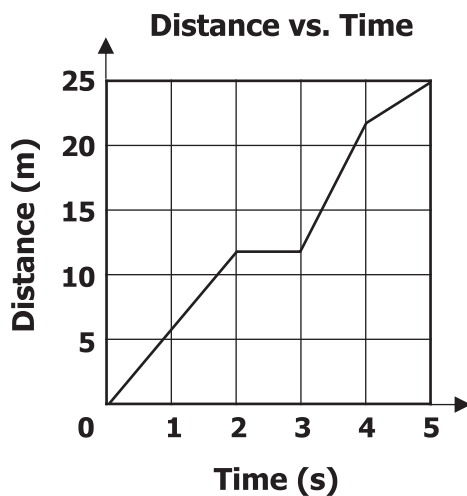
- Q11.** This diagram shows a light bulb. The bottom of the light bulb is shaped so that the bulb fits securely into a light socket.



Which type of simple machine is the bottom of the bulb?

- A** lever      **B** pulley      **C** screw      **D** wedge
- 

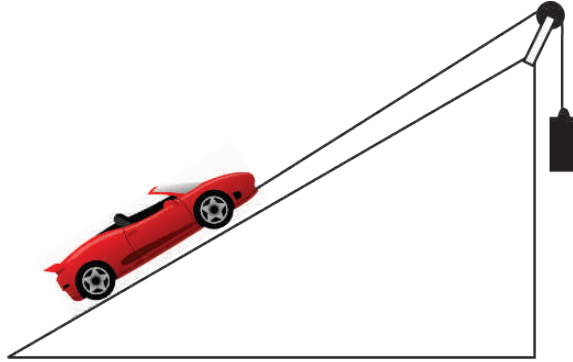
- Q12.** This graph shows the motion of an animal.



When does the animal remain still?

- A** between second 1 and second 2      **B** between second 2 and second 3  
**C** between second 3 and second 4      **D** between second 4 and second 5

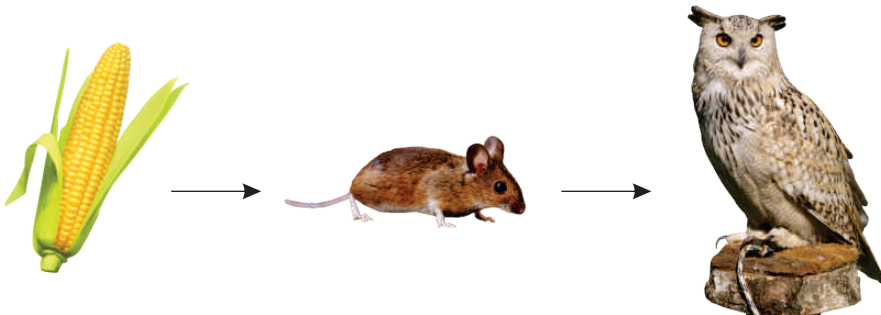
- Q13.** This diagram shows a ramp with a toy car at the bottom. A string is attached to the front of the car and the string goes over a pulley at the top of the ramp. A weight is attached to the other end of the string.



What would be *most* responsible for the toy car being pulled up the ramp?

- A** friction      **B** gravity      **C** kinetic energy      **D** momentum
- 

- Q14.** This diagram shows a food chain.



Which term describes the role of the corn in this food chain?

- A** carnivore      **B** consumer      **C** herbivore      **D** producer

**Q15.** A student is riding a bike and applies the brakes. Which most helps the bike to stop?

**A** friction

**B** gravity

**C** heat

**D** momentum

**Q16.** Two groups of children are each pulling on the opposite ends of a rope. If they are pulling on the rope with equal but opposite forces, what will happen to the rope?



**A** It will stay in place between the two groups.

**B** It will move toward the right.

**C** It will move toward the left.

**D** It will fall to the ground.

**Q17.** Which is the best example of habitat reduction caused by humans?

**A** Birds and animals flee a forest fire caused by lightning.

**B** Birds become sick from eating insects new to their area.

**C** Fish swimming to breeding grounds are blocked by dams.

**D** A new species of fish migrates up a river, competing with native fish for food.



**Q18.** Which of the following statements best describes the climate of an area rather than its weather conditions?

- A** The summers are hot and humid.      **B** The temperature at noon was 86°F.
- C** Total rainfall on April 9 was 2 inches.      **D** Strong winds are expected tomorrow evening.

**Q19.** A student has two plants of the same type, plant X and plant Y. Each plant is in its own pot outside in a sunny location. The student gives both plants the same amount of water and nutrients. The table below shows the student's notes about both plants.

	Plant X	Plant Y
Soil	moist	moist
Number of Roots	many	many
Number of Leaves	12	4
Appearance of Leaves	green	yellow and wilted
Number of Flowers	4	1
Amount of Fruit	1	0
Stem	thick and green	brown spots, small holes, bent
Other Notes	growing quickly	small insects near plant, some dry leaves fell off

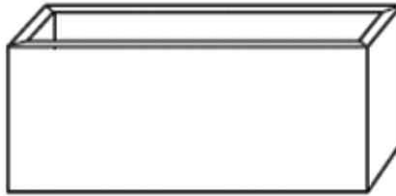
**Based on the student's notes, what is the most likely reason for the differences between the two plants?**

- A** Plant Y's roots were damaged by insects, so it cannot make as much food as plant X can.
- B** Plant Y's flowers were damaged by insects, so it cannot store as many minerals as plant X can.
- C** Plant Y's fruit was damaged by insects, so it cannot attract pollinating insects as well as plant X can.
- D** Plant Y's stem was damaged by insects, so it cannot move as much water to its leaves as plant X can.

- Q20.** A student uses the two containers shown below to investigate the properties of a liquid.



**Container 1**



**Container 2**

The student fills container 1 with a liquid and then pours all the liquid from container 1 into container 2. Based on the student's investigation, which of the following statements best describes a property of a liquid?

- A** It takes the shape of its container.
  - B** It expands to completely fill its container.
  - C** It stays the same shape in different containers.
  - D** It has different weights in different containers.
- 

- Q21.** Small pieces of ice are broken off a large block of ice. Compared to the block of ice, the pieces of ice will completely melt

- A** slower than the block of ice.
- B** faster than the block of ice.
- C** at a higher temperature than the block of ice.
- D** at the same rate as the block of ice.

- Q22.** A student wants to model what causes day and night on Earth. The student uses a globe to represent Earth and a light bulb to represent the Sun. Pictures of the globe and light bulb are shown below.



**Globe**



**Light Bulb**

**How can the student use the globe and light bulb to show what causes day and night on Earth?**

- A** by rotating the globe near the light bulb
  - B** by tilting the globe and rotating the light bulb
  - C** by turning the light bulb on and off near the globe
  - D** by moving the light bulb in a circle around the globe
- 

- Q23.** Which of the following examples best describes one type of energy changing into another?

- A** a magnet sticking to a refrigerator
- B** sound traveling through a solid wall
- C** an electric heater warming up a cold room
- D** light rays bending as they pass through glass

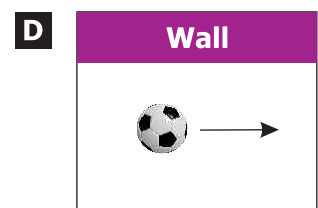
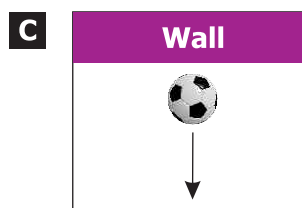
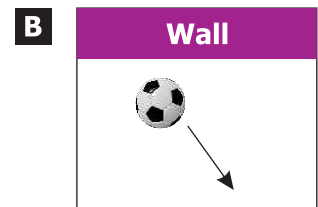
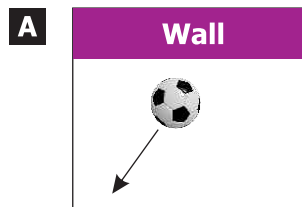
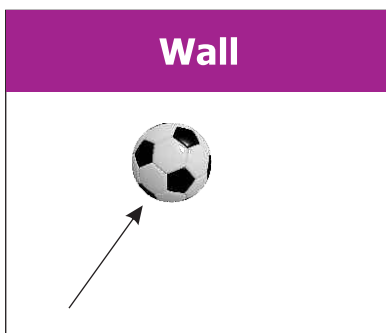
**Q24.** As a city's population grows, wooded areas are replaced by housing developments. What effect will this most likely have on the species in the wooded areas?

- A** More natural predators will move to the wooded areas.
  - B** New species will migrate to the wooded areas.
  - C** A few species will adapt to become predators.
  - D** The population of some species will become zero.
- 

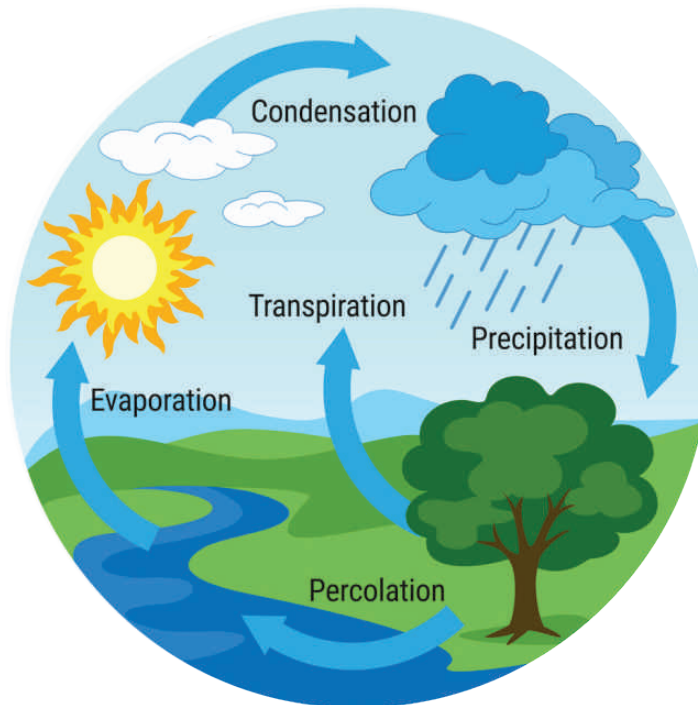
**Q25.** Newton's understanding of gravity was important for the development of which technology?

- A** a satellite that orbits Earth
  - B** a car powered with corn oil
  - C** robots that help with daily tasks
  - D** instruments that detect radio waves coming from space
- 

**Q26.** In which direction will the ball most likely go after it hits the wall?



- Q27.** Not all of the minerals that are added are used by the plants. Some minerals get into streams or lakes. Identify the part of the water cycle that takes minerals into a lake.



- A** Condensation      **B** Evaporation      **C** Precipitation      **D** Collection
- 

- Q28.** Electromagnets can be used to separate materials at recycling centers. Identify each of the tasks at the recycling center that an electromagnet is designed to help perform.

- A** Sorting materials      **B** Moving large objects      **C** Recycling materials      **D** Both a and b

**Q29.** The plants are most likely responding to which factor in the environment?

- A** Light
- B** Water
- C** Oxygen
- D** Carbon dioxide

Plants on a Shelf



**Q30.** This class is going to make ice cream in a bag. They put milk and sugar in a small plastic bag. Then they place the small bag into a large bag of ice. They add salt to the ice, and shake the bag for 5 minutes.

What will happen to the milk when it gets cold?

- A** It will start to melt.
- B** It will become a solid.
- C** It will have less mass.
- D** It will be harder to see.



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## ICATS English Linguistics Contest 2018 National Toppers

Student Name	Father Name	Grade	School	City
FIMAAAN TASSADDUQUE	ROSHAAN TASSADDUQUE	1	KOHINOOR GRAMMAR SCHOOL	FAISALABAD
MUSA NOOR	NOOR NABI	1	FOUNDATION MONTESSORI SCHOOL	BAHAWALPUR
ZAINA KHAN	MUNAWAR AHMED	1	BEACONHOUSE SCHOOL SYSTEM (BKI F-7/4)	ISLAMABAD
MALIK-AL-ASHTER	KHAN MURTAZA	2	MSB INSTITUTE-SHABBIRABAD	KARACHI
JAWAD ALI	MUHAMMAD ASSAD	2	JOINT STAFF PUBLIC SCHOOL AND COLLEGE CHAKLALA	RAWALPINDI
M. ASAD HUSSAIN	SYED M. ASIF HUSSAIN	2	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS XVI)	KARACHI
HIJAB FATIMA	IRFAN QADIR	3	BEACONHOUSE ALLAMA IQBAL TOWN CAMPUS	LAHORE
ZAINEB NADEEM	NADEEM AFZAL	4	KOHSAR CHILDREN'S ACADEMY	MANSEHRA
MARIA FAISAL	FAISAL SALEEM	5	THE CITY SCHOOL GIRLS BRANCH SATELLITE TOWN	RAWALPINDI
IBRAHIM SALMAN	SALMAN RASOOL	6	LAHORE GRAMMAR SCHOOL FAISAL TOWN BRANCH	LAHORE
KHADIJA IMRAN	IMRAN MAGRANI	7	D. A PUBLIC SCHOOL (O/A LEVELS) SEAVIEW	KARACHI
LAIBA MASOOD	MASOOD ABBAS	8	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 1)	KARACHI
EMAAN IFTIKHAR	IFTIKHAR AHMAD	9	BEACONHOUSE SCHOOL SYSTEM PTC GIRLS BRANCH	GUJRANWALA
AYESHA NADEEM	MUHAMMAD NADEEM	10	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS VIII)	KARACHI

## ICATS Mathematics Contest 2018 National Toppers

Student Name	Father Name	Grade	School	City
AMAN ALI AHMAD	MUHAMMAD WASIM	1	LAHORE GRAMMAR SCHOOL (LANDMARK PROJECT)	LAHORE
MIAN AZAAN MAQBOOL	DANISH MAQBOOL	2	ARMY PUBLIC SCHOOL GARRISON JUNIOR	LAHORE
SHAHEER AFZAL	JAVED AFZAL MARWAT	3	ARMY PUBLIC SCHOOL (TODDLERS ACADEMY)	PESHAWAR
MUHAMMAD AHMED	ASMAT ALI	4	ARMY BURN HALL SCHOOL AND COLLEGE (FOR GIRLS)	ABBOTTABAD
M. MURTAZA ZAIDI	BABER ALI	5	BEACONHOUSE ALLAMA IQBAL TOWN CAMPUS	LAHORE
RAJA SAAD ALI	RAJA AAMIR	6	HITEC SCHOOL & COLLEGE FOR BOYS CANTT	TAXILA
ZAID BIN HAROON	M. HAROON RAFIQUE	7	THE SCIENCE SCHOOL	RAWALPINDI
WALEED AHMED	M. ATIQ	8	KIPS SENIOR BOYS CAMPUS JOHAR TOWN	LAHORE
M. RAYAN ABID	M. ABID MUNEEER	9	SIR SYED SCHOOL AND COLLEGE (CAMPUS IV)	WAH CANTT
IMTIAZ KHAN	DADA KHAN	10	AGA KHAN HIGHER SECONDARY SCHOOL	GILGIT

Compete  
if you are the best



## INSTRUCTIONS

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions, Grade 3-4 will fill in circles of 25 questions and Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Grade and School written below, the same would appear at your certificate.
- Use of lead pencil is not allowed.
- Use only Black / Blue ink to fill in the circles.

# ICATS Science Contest 2018 Grade 5-6

Choose only ONE of the FOUR proposed answers (A, B, C or D) and fill in the circle with your answer.

Example of correctly filled table of answers.

<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	Correct Filling Answer "C"	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling
<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling

Q Answer

- 1 ☐ A ☒ B ☐ C ☐ D  
2 ☐ A ☐ B ☒ C ☐ D  
3 ☐ A ☒ B ☐ C ☐ D  
4 ☐ A ☒ B ☐ C ☐ D  
5 ☐ A ☒ B ☐ C ☐ D  
6 ☒ A ☐ B ☐ C ☐ D  
7 ☐ A ☐ B ☒ C ☐ D  
8 ☐ A ☐ B ☐ C ☒ D  
9 ☒ A ☐ B ☐ C ☐ D  
10 ☐ A ☐ B ☒ C ☐ D

Q Answer

- 11 ☐ A ☐ B ☒ C ☐ D  
12 ☐ A ☒ B ☐ C ☐ D  
13 ☐ A ☒ B ☐ C ☐ D  
14 ☐ A ☐ B ☐ C ☒ D  
15 ☒ A ☐ B ☐ C ☐ D  
16 ☒ A ☐ B ☐ C ☐ D  
17 ☐ A ☐ B ☒ C ☐ D  
18 ☒ A ☐ B ☐ C ☐ D  
19 ☐ A ☐ B ☐ C ☒ D  
20 ☒ A ☐ B ☐ C ☐ D

Q Answer

- 21 ☐ A ☒ B ☐ C ☐ D  
22 ☒ A ☐ B ☐ C ☐ D  
23 ☐ A ☐ B ☒ C ☐ D  
24 ☐ A ☐ B ☐ C ☒ D  
25 ☒ A ☐ B ☐ C ☐ D  
26 ☐ A ☒ B ☐ C ☐ D  
27 ☐ A ☐ B ☐ C ☒ D  
28 ☐ A ☐ B ☐ C ☒ D  
29 ☒ A ☐ B ☐ C ☐ D  
30 ☐ A ☒ B ☐ C ☐ D



# INTERNATIONAL CATS CONTESTS

COMPETENCE & APTITUDE TESTING SERVICES  
FASTEST GROWING CONTESTS IN PAKISTAN

## QUESTION BOOKLET



ICATS  
**SCIENCE**  
CONTEST 2019

**GRADE 5 & 6  
(JUNIORS)**

Time Allowed: 90 Mins  
Maximum Marks: 90

## ICATS SCIENCE CONTEST 2019 JUNIORS (GRADE 5 & 6)

**TIME ALLOWED : 90 MINUTES**

**MAXIMUM MARKS : 90**

**TOTAL QUESTIONS : 30 MCQS**

### INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATORS MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
  - A. TODDLERS (GRADE 1 & 2)
  - B. KIDS (GRADE 3 & 4)
  - C. JUNIORS (GRADE 5 & 6)
  - D. JUVENILES (GRADE 7 & 8)
  - E. ADOLESCENTS (GRADE 9 & 10 / O-LEVELS)
11. ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT [WWW.CATSCONTESTS.ORG](http://WWW.CATSCONTESTS.ORG)
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT [INFO@CATSCONTESTS.ORG](mailto:INFO@CATSCONTESTS.ORG)

### Identification Key

Step	Horse Characteristics	Identification
1a	wild horse	go to 2
1b	domestic horse	go to 3
2a	found in North America	Mustang
2b	found in France	Camargue
3a	height greater than 150 centimeters	go to 4
3b	height less than 150 centimeters	go to 5
4a	spotted skin	Appaloosa
4b	skin not spotted	Tennessee walking horse
5a	very small nostrils	Shetland Pony
5b	flaring nostrils	Pony of the Americas

**Q1.** Which of these are all characteristics of the Shetland Pony?

**A** | domestic, height greater than 150 centimeters, very small nostrils

**B** | domestic, height less than 150 centimeters, flaring nostrils

**C** | domestic, height less than 150 centimeters, very small nostrils

**D** | domestic, height greater than 150 centimeters, spotted skin

### Characteristics of a Few Minerals

Mineral	Color	Streak	Hardness	Specific Gravity
talc	white	white	1	2.8
fluorite	purple	colorless	4	3.3
quartz	colorless	colorless	7	2.6
topaz	blue	colorless	9	3.6

**Q2.** These minerals are arranged according to their

**A** | color

**B** | streak

**C** | hardness

**D** | specific gravity

**Read the information given below and answer the questions 3 through 7.**

Salt pans are unusual geologic formations found in deserts. They are formed in endorheic basins, which are lowland areas where water collects but has no outflow. Any rain that falls or any water that is collected in an endorheic basin remains there permanently, except for what is lost through evaporation. This type of closed system often leads to a high concentration of salt and other minerals.

**Study 1**

Four different salt pans around the world were studied. The volumes of mineral deposits were estimated from the surface areas of the salt pans and the average thickness of the deposits. The ages of the salt pans were also estimated based on the mineral volume. The estimates are shown in Table 1.

Table 1		
Salt pan	Estimated mineral volume (km <sup>3</sup> )	Estimated age (million years)
A	2,000,000	4.5
B	4,500,000	5.7
C	5,700,000	10.8
D	12,150,000	21.0

**Study 2**

The same four salt pans were excavated for fossils. Fossil remnants of extinct plant species were found within each of the salt pans. The ages of the fossils found were similar to the ages of the salt pans (See Table 2). Scientists hypothesize that flooding of each salt pan may have led to the extinction of the plant species.

Table 2		
Salt pan	Type of fossils found	Estimated age of fossils (million years)
A	Plant species <i>q</i>	4.4
B	Plant species <i>r</i>	5.5
C	Plant species <i>s</i>	10.2
D	Plant species <i>t</i>	19.9



**Q3.** Which of the following statements is best supported by information in the passage?

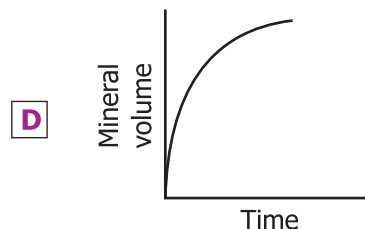
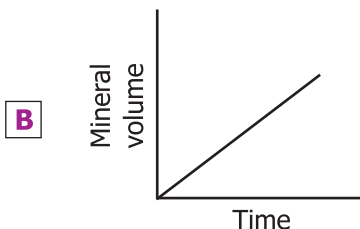
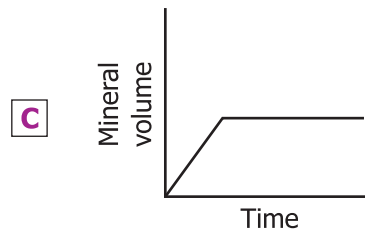
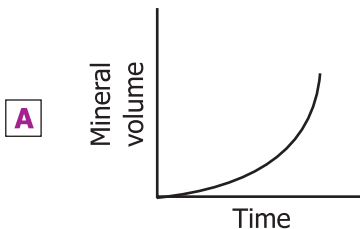
**A** | Water that has collected in endorheic basins is at least 21.0 million years old.

**B** | The age of fossilized plant species cannot be precisely estimated.

**C** | More water has collected in and evaporated from older salt pans.

**D** | Any endorheic basin that is less than 2.0 million years old contains no fossils.

**Q4.** Which one of the following graphs best represents the relationship between the mineral volume and the age of the salt pans, according to Study 1?



**Q5.** Is the conclusion that Salt pan A contains more extinct plant fossils than does Salt pan D supported by information in the passage?

**A** | Yes, because Salt pan A is younger than Salt pan D.

**B** | Yes, because the passage suggests that it is easier for plants to grow in areas with a lower mineral volume.

**C** | No, because Salt pan D contains a different type of fossilized plant.

**D** | No, because the passage does not include data regarding the quantity of plant fossils found in the salt pans.

**Q6.** From the result of Table 1, you could conclude that a salt pan formed more than 21 million years ago would have a mineral value:

**A** | between 5,700,000 km<sup>3</sup> and 12,150,000 km<sup>3</sup>

**B** | equal to approximately  $\frac{1}{2}$  the mineral volume of Salt pan B

**C** | greater than 12,150,000 km<sup>3</sup>

**D** | less than 2,000,000 km<sup>3</sup>

**Q7.** A fossilized plant approximately 9.7 million years old was recently discovered in a salt pan in North America. It was most likely found in a salt pan similar to:

**A** | Salt pan A

**B** | Salt pan B

**C** | Salt pan C

**D** | Salt pan D



**Read the information given below and answer the questions 8 through 12.**

Students in a science class collected soil samples from various locations in order to analyze the composition of the soil. They measured the percentage of the three types of soil minerals—sand, silt, and clay—in each sample. Their data is presented in Table 1. The students also measured the size of the mineral particles found in the soil samples. The particle size ranges are listed in Table 2.

Table 1			
Soil sample	Sand (%)	Clay (%)	Silt (%)
1	65	10	25
2	10	75	15
3	25	35	40
4	60	20	20
5	55	30	15

Table 2	
Type of mineral particle	Size range of particles (mm)
Sand	2.0-0.06 mm
Silt	0.06-0.002 mm
Clay	less than 0.002 mm

**Q8.** According to Table 1, Sample 3 was composed primarily of:

**A** | sand and clay

**B** | clay and silt

**C** | silt and sand

**D** | sand only

**Q9.** Based on the data in Table 1, Sample 5 contained:

**A** | more sand than silt

**B** | more clay than sand

**C** | less clay than silt

**D** | less sand than silt

**Q10.** Which soil sample is most likely to have an average mineral particle size of 1.3 millimeters?

**A** | Sample 2

**B** | Sample 3

**C** | Sample 4

**D** | Sample 5

**Q11.** The students collected a sixth soil sample from a location near the location from which they collected Sample 4. Based on information in the passage, this sixth sample would contain mineral particles that were predominantly:

**A** | smaller than 0.002 mm

**C** | larger than 0.06 mm

**B** | smaller than 0.06 mm

**D** | larger than 2.0 mm

**Q12.** Sample 2 would most likely, if measured, have an average mineral particle size of:

**A** | 1.5 mm

**B** | 1.0 mm

**C** | 0.06 mm

**D** | 0.001 mm

**Q13.** A baseball strikes the roof of a car and dents it. The paint on the roof begins to crack and chip, exposing the metal. The exposed metal on the roof rusts, eventually causing a small hole in the roof. Which event is a chemical change?

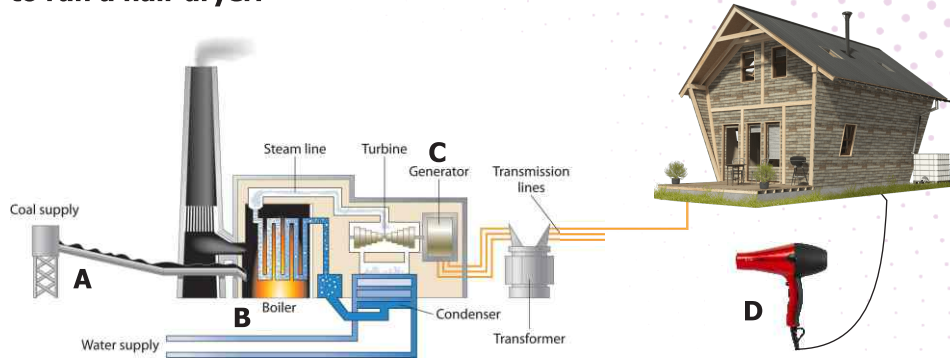
**A** | The baseball strikes the roof.

**C** | The paint cracks and chips.

**B** | The roof of the car dents.

**D** | The exposed metal rusts.

**Q14.** The diagram below shows the steps necessary to produce the energy needed to run a hair dryer.



As it moves from location A to location D in the diagram, the energy stored in the coal

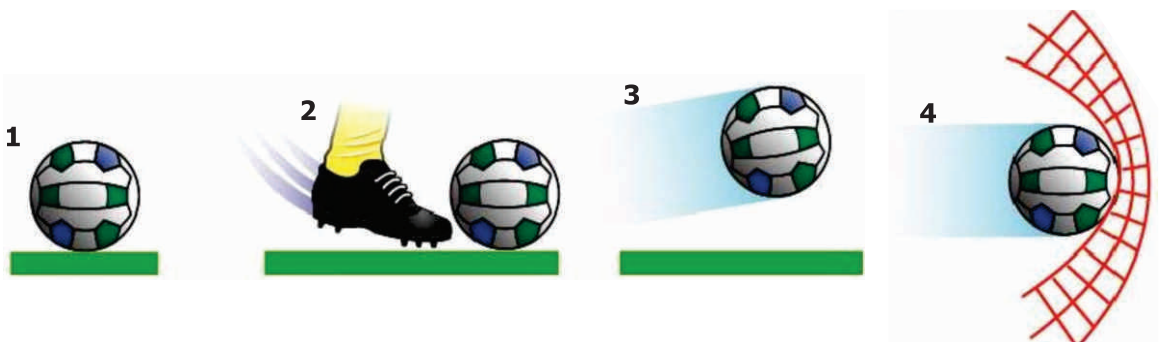
**A** | is converted to solar energy

**C** | is recycled

**B** | reduces the friction in the hair dryer

**D** | is transformed

**Q15.** The images below illustrate law of motion.



Which statement best summarizes the scientific concept shown in the above images?

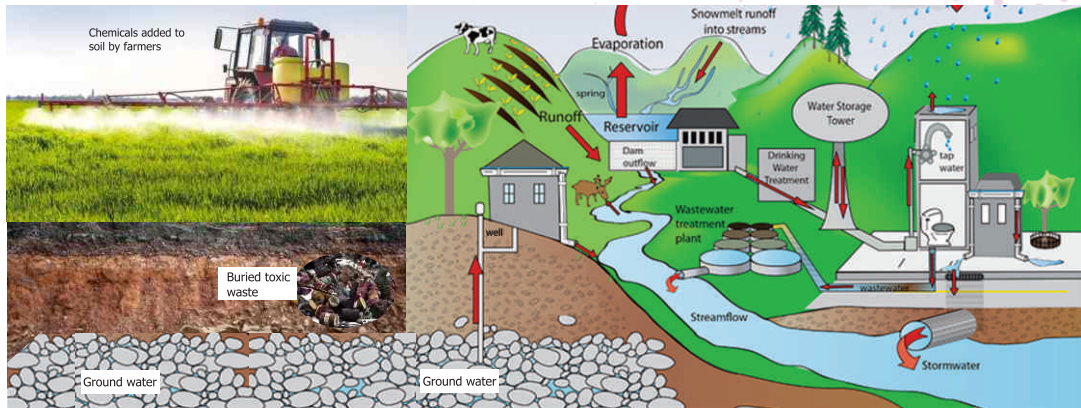
**A** | A falling body accelerates at a constant speed.

**B** | The motion of an object is constantly changing due to magnetic forces.

**C** | The force of friction causes an object in motion to move faster.

**D** | A body in motion will remain in motion unless influenced by an outside force.

**Q16.** The diagram below shows some ways in which groundwater can be affected by humans.



(not drawn to scale)

**Which statement is best supported by the diagram?**

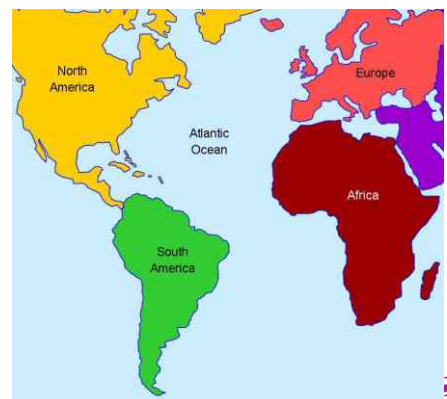
- A** | Chemicals applied by farmers lower the level of pollution in drinking water.
- B** | Drinking water can become polluted from unsuspected sources.
- C** | Human activities do not affect groundwater.
- D** | Toxic waste is safe if buried below the level of the basements of nearby homes.



**Q17.** The map below shows the probable location of some of the continents at one time in the past.

**What feature of the continents best suggests that they were once joined?**

- A** | Some continents fit together like puzzle parts.
- B** | Some continents are the same size.
- C** | All continents have mountain ranges.
- D** | All continents contain the same crustal composition.



**Q18.** The drawing below shows the original size and shape of a rock sample before it is thrown into a rapidly moving stream.



Which drawing best shows the size and shape the rock will have after being carried several hundred miles downstream and deposited?



**Q19.** Several tomato plants are grown indoors next to a sunny window. The plants receive water and fertilizer and remain on the windowsill. What will most likely happen?

**A** | Most of the leaves on the window side will wilt and die.

**B** | The roots of the plants will grow upward from the soil.

**C** | Water droplets will collect on the leaves facing away from the window.

**D** | The stem will bend toward the window.

**Q20.** When placed in direct sunlight, which object will absorb the most visible light energy?

**A** | a piece of clear glass

**B** | a snowball

**C** | a shiny mirror

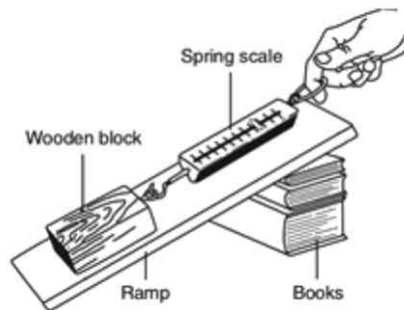
**D** | a black sweater

**Q21.** Which statement best describes the relationship between the deer and the plants?



- A** | The deer supplies food and oxygen to the green plants.
- B** | The deer supplies food and carbon dioxide to the green plants.
- C** | The green plants supply food and carbon dioxide to the deer.
- D** | The green plants supply food and oxygen to the deer.

**Q22.** Which change would require more force to pull the wooden block up the ramp?



- A** | Have the student use two hands.
- B** | Reduce the mass of the wooden block.
- C** | Restack the books so the thinnest book is on the bottom.
- D** | Glue sandpaper to the surface of the ramp.



**Q23.** The table below shows the deer population in Arizona for a 30-year period.

**Deer Population in Arizona**

Year	Average Number of Deer per 1,000 Acres
1905	5.7
1915	35.7
1920	142.9
1925	85.7
1935	25.7

**What is the most likely reason that the deer population decreased from 1920 to 1935?**

- A** | There was less air pollution.
- B** | More water was available.
- C** | Fewer hunting licenses were issued.
- D** | There was increased competition for food.

**Q24.** The data table below compares cars and light trucks in regard to gas mileage and the amount of gases released into the environment (emissions).

**Data Table**

Type of Vehicle	Average Gas Mileage (miles per gallon)	Average Nitrogen Oxide Emissions (grams per mile)	Average Carbon Dioxide Emissions (pounds per mile)
Cars	27.5	0.4	0.72
Light trucks*	20.7	0.8	0.95

\*Light trucks include sport utility vehicles, minivans, and pickup trucks.

**Based on the information in the table, which conclusion can be made about light trucks?**

- A** | They get more average miles per gallon than cars.
- B** | They have become more popular than cars in recent years.
- C** | They produce less nitrogen oxide and carbon dioxide emissions than cars.
- D** | They have a greater negative impact on the environment than cars.



**Q25.** Moving water in a river is considered a renewable resource because it

**A** | carries dissolved oxygen

**C** | is made of natural gas

**B** | easily erodes sediments

**D** | can be recycled by nature over time

**Q26.** The structures found in a living cell can be compared to the parts of a factory that produces cars. Which part of the factory is most similar to the nucleus of a living cell?

**A** | a conveyor belt that transports materials

**B** | a storage bin that holds the pieces needed to assemble a car

**C** | the computer room that controls the assembly process

**D** | the generator that provides energy for the factory

**Q27.** Water at 20°C in an uncovered pan is evaporating very slowly. What could be done to the water to make it evaporate more quickly?

**A** | Cover it

**B** | Heat it

**C** | Place it in the dark

**D** | Put salt in it

**Q28.** The Moon has the greatest effect on Earth's

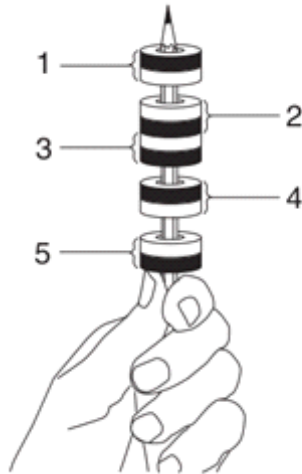
**A** | year

**B** | ocean tides

**C** | seasons

**D** | daylight hours

- Q29.** A student put five ring magnets on a pencil. The magnets are labeled 1, 2, 3, 4, and 5.



Which two magnets are attracting each other?

**A** | 1 and 2

**B** | 2 and 3

**C** | 3 and 4

**D** | 4 and 5

- Q30.** The diagram below shows water being heated in a flask. The flask has a rubber stopper with a glass tube extending through it. The current level of the water in the glass tube is indicated. The temperature of the water is 25°C.

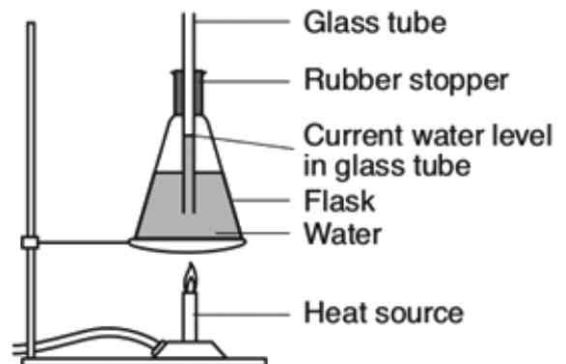
If heating continues, the water in the glass tube will most likely

**A** | turn into a solid

**B** | become more dense

**C** | move into the flask

**D** | rise higher in the tube



## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. In the top right corner, there is a decorative pattern of small purple dots arranged in a grid-like fashion, which fades out towards the center of the page. The overall appearance is that of a clean, unused notebook or worksheet.

**Blank Page**

[illegible]

## ICATS English Linguistics Contest 2019 National Toppers

Student Name	Father Name	Grade	School	City
AMATULLAH	ADNAN	1	MSB EDUCATIONAL INSTITUTE	KARACHI
MUHAMMAD MOHSIN	WAHEED SHEHZAD	1	RANGERS PUBLIC SCHOOL FOR BOYS	LAHORE
ZAIN-UL-ABIDIN	INAM-ULLAH	2	ARMY PUBLIC SCHOOL GARRISON JUNIOR	LAHORE
MUHAMMAD ASIS JAVED	MUHAMMAD SHAHEER JAVED	3	THE CITY SCHOOL CHASHMA BRANCH	MIANWALI
AYESHA SIDDIQUI	M. ASHRAF UL KABIR SIDDIQUI	4	THE CITY SCHOOL GULSHAN JUNIOR CAMPUS	KARACHI
AYESHA FAISAL	FAISAL EHSAN	5	LAHORE GRAMMAR SCHOOL LANDMARK PROJECT	LAHORE
ASAD IMRAN	M. IMRAN	6	THE CITY SCHOOL CANTT CAMPUS II	QUETTA
MANAAL TARIQ	DR. TARIQ MEHMOOD	7	THE CITY SCHOOL GIRLS CAMPUS	SIALKOT
FIZZA RIZVI	ALI ABBAS RIZVI	8	HABIB GIRLS SCHOOL	KARACHI
LAMISAH BEHRAM KHAN	BEHRAM BASHIR KHAN	9	LAHORE GRAMMAR SCHOOL	ISLAMABAD
FAIZ UL HASSAN GILANI	GHULAM UL HUSSAIN GILANI	10	THE CITY SCHOOL TOWN SENIOR SECTION	PESHAWAR

## ICATS Mathematics Contest 2019 National Toppers

Student Name	Father Name	Grade	School	City
HIBA MALIK	BILAL MALIK	1	KOHSAR CHILDREN'S ACADEMY	MANSEHRA
DURYAB ZAHRA	MUHAMMAD RASHID	1	BEACONHOUSE HAFIZABAD	HAFIZABAD
ABDUL RASHEED	ABDUL WAHEED	2	ARMY PUBLIC SHOO & COLLEGE SYSTEM SADDAR CAMPUS	KARACHI
BURHANUDDIN	M. ALI ASGHER SAMIWALA	2	MSB EDUCATIONAL INSTITUTE	KARACHI
M. HUMMAS	M. SHAKIL	3	DEFENCE HOUSING AUTHORITY COLLEGE AND SCHOOL SYSTEM	KARACHI
EHAN QURESHI	ASSADULLAH QURESHI	4	FFC GRAMMAR SCHOOL AND COLLEGE	MIRPUR MATHELO
MAHAD ABID	M. HARIS UMER	5	THE CITY SCHOOL CHENAB CAMPUS	FAISALABAD
UROOJ AJMAL	AJMAL IBRAHIM	6	KIPS SCHOOL	LAHORE
MUHAMMAD SALAMAT	SADAT MEHMOOD	7	GARRISON ACADEMY TUFAIL SHAHEED CAMPUS (SENIOR)	LAHORE
ABDULLAH JUNAID KHAN	ABDUL RAUF	8	THE SCIENCE SCHOOL	ISLAMABAD
SAAD ALI HASSAN	ABDUL HAYEE	8	THE SCIENCE SCHOOL	RAWALPINDI
DANIYAL KALEEM SHEIKH	MUHAMMAD KALEEM	9	ROOTS IVY INTERNATIONAL SCHOOL IB CAMPUS	RAWALPINDI
AHMED ALI	AUN ALI	10	MSB EDUCATIONAL INSTITUTE	KARACHI

**COMPETE** if you are  
the **BEST**



## INSTRUCTIONS

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions, Grade 3-4 will fill in circles of 25 questions and Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Grade and School written below, the same would appear at your certificate.
- Use of lead pencil is not allowed.
- Use only Black / Blue ink to fill in the circles.

# ICATS Science Contest 2019 Grade 5-6

Choose only ONE of the FOUR proposed answers (A, B, C or D) and fill in the circle with your answer.

Example of correctly filled table of answers.

<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	Correct Filling Answer "C"	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling
<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input checked="" type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling	<input type="radio"/> A	<input type="radio"/> B	<input checked="" type="radio"/> C	<input type="radio"/> D	wrong filling

Q. No.      Answer

- |    |                                    |                                    |                                    |                                    |
|----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1  | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 2  | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 3  | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 4  | <input type="radio"/> A            | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 5  | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 6  | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 7  | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 8  | <input type="radio"/> A            | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 9  | <input checked="" type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input type="radio"/> D            |
| 10 | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |

Q. No.      Answer

- |    |                                    |                                    |                                    |                                    |
|----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 11 | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 12 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 13 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 14 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 15 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 16 | <input type="radio"/> A            | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 17 | <input checked="" type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input type="radio"/> D            |
| 18 | <input type="radio"/> A            | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 19 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 20 | <input type="radio"/> A            | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |

Q. No.      Answer

- |    |                         |                                    |                                    |                                    |
|----|-------------------------|------------------------------------|------------------------------------|------------------------------------|
| 21 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 22 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 23 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 24 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 25 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |
| 26 | <input type="radio"/> A | <input type="radio"/> B            | <input checked="" type="radio"/> C | <input type="radio"/> D            |
| 27 | <input type="radio"/> A | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 28 | <input type="radio"/> A | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 29 | <input type="radio"/> A | <input checked="" type="radio"/> B | <input type="radio"/> C            | <input type="radio"/> D            |
| 30 | <input type="radio"/> A | <input type="radio"/> B            | <input type="radio"/> C            | <input checked="" type="radio"/> D |



# INTERNATIONAL CATS CONTESTS

COMPETENCE & APTITUDE TESTING SERVICES

**FASTEST GROWING CONTESTS IN PAKISTAN**



## ICATS SCIENCE

CONTEST 2021

## Question Booklet GRADE 5 & 6 JUNIORS

*Time Allowed: 90 Mins.*

*Maximum Marks: 90*



# ICATS SCIENCE CONTEST 2021

## JUNIORS (GRADE 5 & 6)

TIME ALLOWED : 90 MINUTES

MAXIMUM MARKS : 90

TOTAL QUESTIONS : 30 MCQS

### INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATORS MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
  - A. TODDLERS (GRADE 1 & 2)
  - B. KIDS (GRADE 3 & 4)
  - C. JUNIORS (GRADE 5 & 6)
  - D. JUVENILES (GRADE 7 & 8)
  - E. ADOLESCENTS (GRADE 9 & 10 / O-LEVELS)
11. ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT [WWW.CATSCONTESTS.ORG](http://WWW.CATSCONTESTS.ORG)
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT [INFO@CATSCONTESTS.ORG](mailto:INFO@CATSCONTESTS.ORG)

**Q1.** Which property do these four objects have in common?



sapphire



bracelet



trombone



metal bar

**Select the best answer.**

**A** | shiny

**B** | fragile

**C** | salty

**D** | transparent



**Q2.** Ella plays with her niece. When she pulls the sled's rope forward, the rope also pulls her backward.

**As Ella walks, she can feel the pull of the rope on her hand.**



**What is the direction of this force?**

**A** | toward the rope

**B** | toward Ella

**C** | upwards

**D** | downwards

- Q3.** The text below describes a pair of opposing forces. Read the text. Then answer the question below.



Two dogs, Buddy and Lola, play with a rope. Think about two of the forces that act on the rope:

- Lola pulls away from Buddy.
- Buddy pulls toward himself.

As buddy pulls on the rope, what is the direction of the opposing force?

**A** | away from Buddy

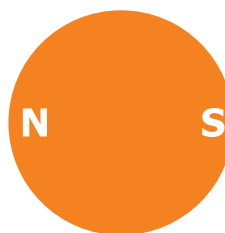
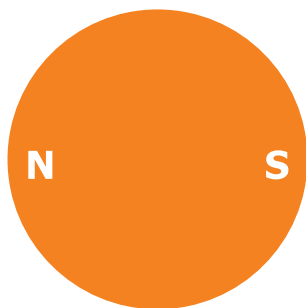
**B** | toward Buddy

**C** | upwards

**D** | downwards



- Q4.** Two magnets are placed as shown.



Will these magnets attract or repel each other?

**A** | attract

**B** | repel

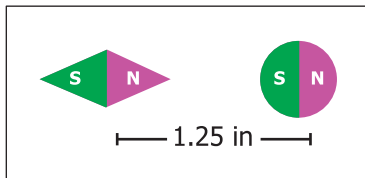
**C** | first attract then repel

**D** | none of these

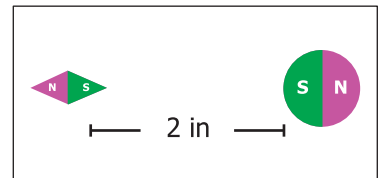
**Q5.** The images below show four pairs of magnets. The magnets in different pairs do not affect each other. All the magnets shown are made of the same material, but some of them are of different sizes and shapes.

Think about the magnetic force between the magnets in each pair. Select the pair with the magnetic force of smallest magnitude.

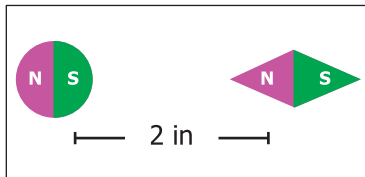
**A**



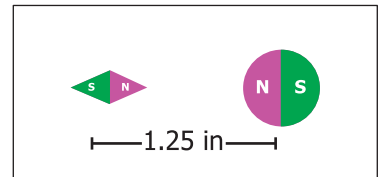
**C**



**B**



**D**



**Q6.** Breathing is a process that refers to the inhaling and exhaling of

**A** | gas

**B** | air

**C** | molecule

**D** | proton

**Q7.** Intake of carbon dioxide and giving out of oxygen is the only process named

**A** | photosynthesis

**B** | respiration

**C** | rusting

**D** | excretion

**Q8.** Weather on Earth is caused by heat from the sun and \_\_\_\_\_ .

**A** | climate

**B** | slope

**C** | wind

**D** | direction



**Q9.** Compared to the temperature, more oxygen is present in

**A** | clean water

**B** | hot water

**C** | cold water

**D** | dilute water



**Q10.** Which organ allows nutrients from digested food to be absorbed into the body's blood stream?

**A** | bladder

**B** | liver

**C** | diaphragm

**D** | small intestine



**Q11.** We can find them growing on the ground in deserts, on the sides of dry rock, hanging from the branches of trees, those are \_\_\_\_\_ .

**A** | crab

**B** | amoeba

**C** | lichens

**D** | snail

**Q12.** People use apple trees for food. We usually eat the part of this plant that contains the seeds. It grows from a pollinated flower.

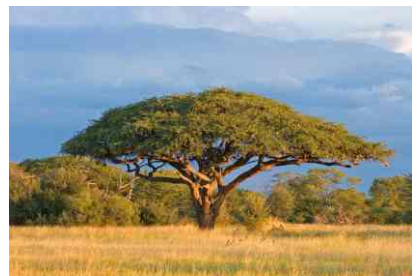
Which part of the apple tree do we usually eat?

- A** | the fruit
- B** | the root
- C** | the stem
- D** | all of these



**Q13.** A savanna is a warm grassland with a few trees and shrubs. Savannas have a long dry season, during which food is hard to find. Some animals solve this problem by eating the leaves of tall trees.

Which animal's neck is best adapted for reaching the branches of a tall acacia tree?



**A**



giraffe

**B**



hippopotamus

**C**



warthog

**D**



cow



**Q14.** A fish near the surface of the water might look like easy prey. But many fish are fast and slippery. This helps them escape from predators.

Which animal's feet are best adapted to grab a fish swimming near the surface of the water?



brahminy kite



ostrich



mallard



hen



**Q15.** Crystal Cove is a beach in southern California. It was mostly clear at the beach on Friday because there was a high pressure system over the coast.

Does this passage describe the weather or the climate?

**Hint:** Weather is what the atmosphere is like at a certain place and time. Climate is the pattern of weather in a certain place.



**A** | weather

**B** | climate

**C** | Neither weather nor climate.

**D** | Both, weather and climate.

**Q16.** Below are three examples of using energy from natural resources. Select the use of energy that did not add to air pollution.

- A** Because gasoline had become expensive, the engine on a police car was changed. The new engine burned propane, a fuel made from natural gas.
- B** A power plant used a river's flowing water to produce electricity. This type of power plant is called a hydroelectric power plant.
- C** When the railway from Saint Petersburg to Moscow in Russia opened in 1851, its trains had engines that burned wood.
- D** The engine of a container ship burned fuel made from petroleum oil.



**Q17.** Select the part whose main job is to give strength and stiffness to a plant cell.

**A** | cytoplasm

**B** | cell wall

**C** | chloroplasts

**D** | mitochondria



**Q18.** Read the passage. Then answer the question.

Most of Earth's surface is covered by salt water located in oceans. Ocean water contains between three percent and four percent salt. This is about as salty as one teaspoon of salt mixed into a six-ounce cup of water.



The water in rivers also contains a tiny amount of salt. Rivers eventually carry this salt into oceans. As ocean water evaporates, salts and minerals are left behind. Over time, the ocean becomes more and more salty.

- A. Ocean water contains equal amounts of salt and water.
- B. Rivers move salt into oceans.
- C. Salt remains in the oceans when ocean water evaporates.
- D. Glaciers cover most of Earth's surface.

How many of the above statements are true?

**A** | 1

**B** | 2

**C** | 3

**D** | 4



**Q19.** Ahmad intends to visit his friend in the neighboring city. How long is the road from his city to his friend's city? Select the best estimate.

**A** | 3 feet

**B** | 3 yards

**C** | 3 inches

**D** | 3 miles



**Q20.** Aslam purchased a large trash can for his office. What could be its volume? Select the best estimate.

**A** | 17 cups

**B** | 17 fluid ounces

**C** | 17 gallons

**D** | none of these

**Q21.** Areeba purchased a new pen. How long that could be? Select the best estimate.

**A** | 6 inches

**B** | 6 feet

**C** | 6 yards

**D** | 6 miles



**Q22.** Daewoo Pakistan added a new bus into their fleet. What could be the mass of that city bus? Select the best estimate.

**A** | 10 ounces

**B** | 10 tons

**C** | 10 pounds

**D** | 10 kgs



**Q23.** Sughra is drinking coffee in a cold day of winter. What could be the temperature of a cup of hot coffee? Select the best estimate.

**A** | 145 °C

**B** | 145 °F

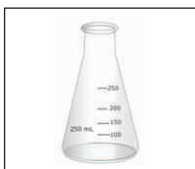
**C** | -145 °C

**D** | -145 °F



**Q24.** Ajmal needs a funnel to do an experiment in the science lab. Which one of the following he needs?

**A**



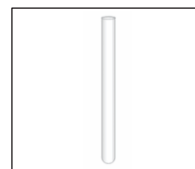
**B**



**C**



**D**



**Q25.** To check a leaf that either it has made food or not we can use test using

**A** | iron solution

**B** | iodine solution

**C** | calcium solution

**D** | water

**Q26.** Read the text about an animal in motion.

A gecko used its sticky feet to crawl from the bottom of a window to the top of the window.

Complete the statement. Assume that the gecko's mass did not change.

The gravitational potential energy stored between the gecko and Earth \_\_\_\_\_ as the gecko crawled on the window.

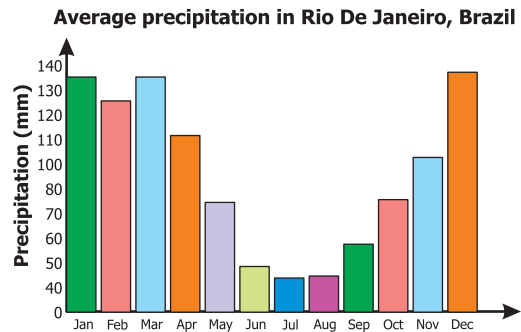
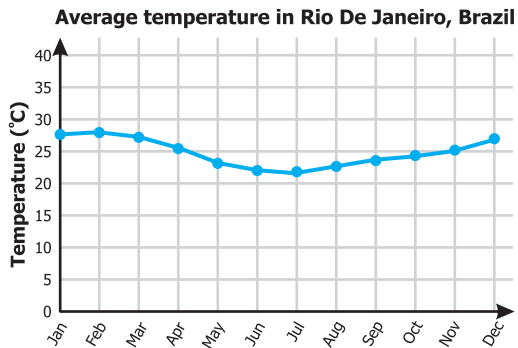
**A** | increased

**B** | decreased

**C** | stayed the same

**D** | none of these

**Q27.** Use the graphs to answer the question below.



Select the best weather prediction for Rio De Janeiro in November.

**A** | The average temperature will be higher than in December, and there will be about 60 millimeters of precipitation.

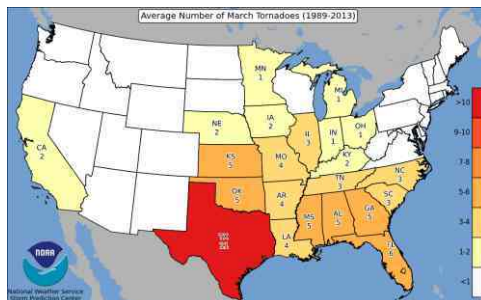
**B** | There will be a higher average temperature and more precipitation than in April.

**C** | It will be warmer and wetter than in July.

**D** | The average temperature will be about 20 °C, and there will be more precipitation than in July.

- Q28.** Natural hazard maps can show data about large areas, such as entire countries, or smaller areas, such as states or cities. The map below shows data about tornadoes in a region.

Which of the following areas had the largest number of tornadoes between 1989 and 2013?



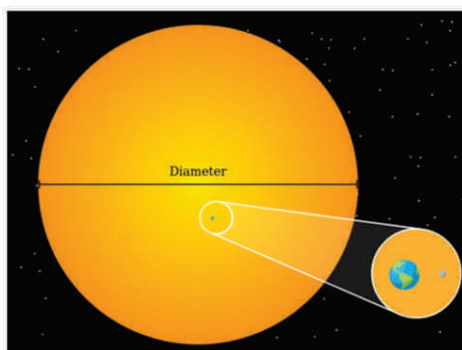
**A** | OK

**C** | TX

**B** | MN

**D** | OH

- Q29.** Our solar system is made up of the Sun and all the objects that move around it. These objects include planets, moons, asteroids, and comets. The sizes of the objects in the solar system are difficult to imagine without the help of a model. Models make certain characteristics of a system easier to understand. A model can be a physical object, a graph, a diagram, or a simulation. The diagram below is a model that shows the relative sizes of the Sun, the Moon, and Earth. The two small dots represent the accurate sizes of Earth and the Moon compared to the Sun. A close-up view of Earth and the Moon is also shown.



Complete the sentence to estimate the diameter of the Sun compared to Earth.

The Sun's diameter is about \_\_\_\_\_ times greater than Earth's.

**A** | 100

**B** | 3

**C** | 10

**D** | 50

**Q30.** The passage below describes a student creating a physical model of Earth's rotation.



Tony is creating a model showing how Earth rotates over the course of one day. He uses a globe to represent Earth.

Tony knows that Earth spins on its axis, completing one rotation every 24 hours. He slowly spins the globe counterclockwise, completing one rotation in about 6 seconds.

In Tony's model, 1 second of rotation represents about \_\_\_\_\_ .

**A** | 2 hours

**B** | 4 hours

**C** | 6 hours

**D** | 8 hours

National Toppers  
ICATS  
ART  
Contest  
2021

Student Name	Father Name	Grade	School
TEHREEM SHIRAZ	SYED SHIRAZ ALAM	1	CANTT. PUBLIC HIGH SCHOOL & GIRLS COLLEGE (HYDERABAD)
MUHAMMAD AHMED KHAN	UZAIR AHMAD KHAN	2	ARMY PUBLIC SCHOOL (JUNIOR)
RAMISHA SAHAR	RAJA ISHAQ ASAD	3	FATIMA FERTILIZER SCHOOL
ZARLISH MOMINAH	TAYYAB SIDDIQUE	4	ARMY PUBLIC SCHOOL (DEFENCE COMPLEX ISLAMABAD)
DARSAMIN RAFIQUE	AZHAR RAFIQUE	5	NOVA CITY SCHOOL
AAFEEN KHALIL	KHALIL FAZIL	6	ISLAMABAD COLLEGE OF ARTS AND SCIENCES
HOORIA NOUMAN	NOUMAN ILYAS	7	KOSHAR CHILDREN'S ACADEMY
FATIMA RIZWAN	RIZWAN LIAQAT	8	LAHORE GRAMMAR SCHOOL
DUA ZAIN	M. ZAIN	9	HIRA FOUNDATION SCHOOL
WAJIHA SHAKEEL	SHAKEEL SIDDIQ	10	THE INTELLECT SCHOOL

*Congratulations*

National Toppers  
ICATS  
Creative Writing  
Contest  
2021

Student Name	Father Name	Grade	School
MUHAMMAD HAZIQ UMAR	UMAR SARWAR	1	LAHORE GRAMMAR SCHOOL
M ABDULLAH	IKHTIYAR AHMED	2	FAUJI FOUNDATION SCHOOL (JAND)
ALISHBA HAMEED	ABDUL HAMEED	3	ST. GREGORY'S HIGH SCHOOL
SHAHMEER	AMEER HUSSAIN	4	LAHORE GRAMMAR SCHOOL (VALENCIA TOWN)
ESHAAL ALEEM	ALEEM AHMED KHAN	5	THE CITY SCHOOL (GULSHAN JUNIOR CAMPUS)
MUHAMMAD YAHYA	IFTIKHAR MANZOOR	6	INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD SCHOOL
SYEDA SABA ZAWAR	SYED ZAWAR	7	THE CITY SCHOOL (HELUM CAMPUS)
EMAN AMNA	AFTAB	8	HAYAT SCHOOL & COLLEGE
ALIZHA NOOR ARSHAD	MRS. FOZIA ARSHAD	9	THE INTERNATIONAL SCHOOL OF CHOUEIFAT
MANAAM RAZA	RAZA UL MOHSIN	10	LAHORE GRAMMAR SCHOOL (1A1 SENIOR)

*Congratulations*

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if you are the best



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**CATS CONTESTS**  
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FASTEST GROWING CONTESTS IN PAKISTAN

DO NOT WRITE ANYTHING ABOVE THIS LINE

## Answer Sheet

### INSTRUCTIONS

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions, Grade 3-4 will fill in circles of 25 questions and Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Grade and School written below, the same would appear at your certificate. Make all corrections on the Attendance Sheet only.
- Use of lead pencil is not allowed. Use only Black / Blue ink to fill in the circles.

# ICATS Science Contest 2021 Grade 5-6

Choose only ONE of the FOUR proposed answers (A, B, C or D) and fill in the circle with your answer.

Example of correctly filled answer. (A) (B) (C) (D) Correct Filling Answer "C"

Q. No. Answer

- 1 ● (B) (C) (D)  
2 ● (B) (C) (D)  
3 ● (B) (C) (D)  
4 ● (B) (C) (D)  
5 (A) ● (C) (D)  
6 (A) ● (C) (D)  
7 ● (B) (C) (D)  
8 (A) (B) ● (D)  
9 (A) (B) ● (D)  
10 (A) (B) (C) ●

Q. No. Answer

- 11 (A) (B) ● (D)  
12 ● (B) (C) (D)  
13 ● (B) (C) (D)  
14 (A) (B) ● (D)  
15 ● (B) (C) (D)  
16 (A) ● (C) (D)  
17 (A) ● (C) (D)  
18 (A) ● (C) (D)  
19 (A) (B) (C) ●  
20 (A) (B) ● (D)

Q. No. Answer

- 21 ● (B) (C) (D)  
22 (A) ● (C) (D)  
23 (A) ● (C) (D)  
24 (A) ● (C) (D)  
25 (A) ● (C) (D)  
26 ● (B) (C) (D)  
27 (A) (B) (C) ●  
28 (A) (B) ● (D)  
29 ● (B) (C) (D)  
30 (A) ● (C) (D)

# ICATS SCIENCE CONTEST



## 2022 QUESTION BOOKLET

**GRADE 5 & 6  
JUNIORS**

Time Allowed: 90 Mins.  
Maximum Marks: 90



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# ICATS SCIENCE CONTEST 2022

## JUNIORS (GRADE 5 & 6)

**TIME ALLOWED : 90 MINUTES, MAXIMUM MARKS : 90**

**TOTAL QUESTIONS : 30 MCQS**

### INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATORS MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
  - A. TODDLERS (GRADE 1 & 2)
  - B. KIDS (GRADE 3 & 4)
  - C. JUNIORS (GRADE 5 & 6)
  - D. JUVENILES (GRADE 7 & 8)
  - E. ADOLESCENTS (GRADE 9 & 10 / O-LEVELS)
11. REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT [WWW.CATSCONTESTS.ORG](http://WWW.CATSCONTESTS.ORG)
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT [INFO@CATSCONTESTS.ORG](mailto:INFO@CATSCONTESTS.ORG)

**Q1.** A diagram of a moon phase is shown below.



Which shows the correct order of the moon phases that would follow?

**A**



First Quarter



Full Moon



Crescent Moon

**B**



First Quarter



Full Moon



Last Quarter

**C**



Full Moon



Crescent Moon



First Quarter

**D**



Crescent Moon



Full Moon



First Quarter

**Q2. Which of these is the correct order of the planets (including the dwarf planet)?**

- A** Mercury, Venus, Mars, Earth, Saturn, Jupiter, Uranus, Neptune, Pluto
- B** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto
- C** Mars, Venus, Earth, Mercury, Jupiter, Saturn, Uranus, Neptune, Pluto
- D** Earth, Venus, Mercury, Mars, Jupiter, Saturn, Neptune, Pluto, Uranus



**Q3. Which color cloud is carrying the most water?**



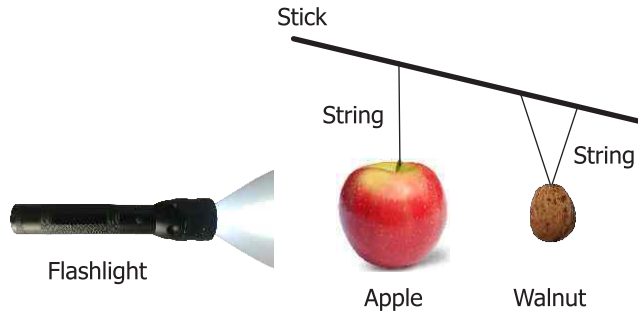
- A** White
- B** Light gray
- C** Dark gray
- D** Black



**Q4. Many woodland birds have adapted short wings. What advantage does this give them?**

- A** Short wings help birds fly quietly
- B** Short wings help birds fly between trees
- C** Short wings help birds find more food
- D** Short wings keep birds cooler in the summer

**Q5.** A teacher uses a flashlight, an apple, and a walnut to show a lunar eclipse.



This lab setup best demonstrates that a lunar eclipse occurs during a

**A** New moon.

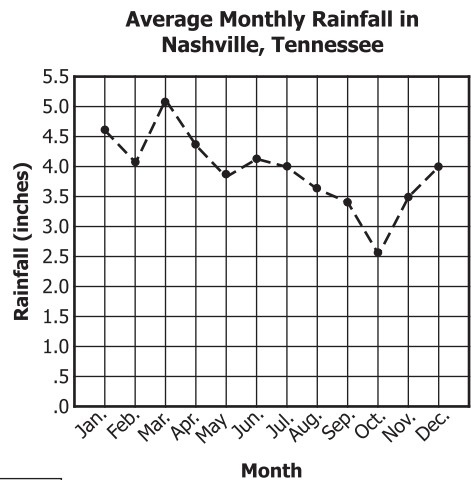
**B** Full moon.

**C** First quarter moon.

**D** Crescent moon.

**Q6.** A group of students researched and collected data for a report on the weather in Nashville, Tennessee, for one year.

Based on the data, the students concluded that all cities in Tennessee will receive approximately 3.6 inches of rainfall next August. Which best explains why the students' conclusion is incorrect?



**A** The data collected did not include yearly rainfall amounts.

**B** The data collected did not include daily rainfall amounts.

**C** Rainfall averages were collected only from one city.

**D** Rainfall averages were not compared to a previous year.

**Q7.** Atif often sees birds near his school. He wants to find out how these birds get the energy they need to live. Which investigation would best help Atif answer this question?

- A** Using the Internet to learn where these birds live
- B** Counting the number of these birds near his school
- C** Asking the teacher if other animals eat these birds
- D** Observing what these birds eat every day for a week



**Q8.** Many desert lizards spend daylight hours under rocks, as shown.



This behavior is mainly a response to which part of the environment?

- A** lack of rain
- B** high temperatures
- C** shifting sand
- D** high winds



**Q9.** Which of the following is the smallest bird of the world?

- A** Hummingbird
- B** Robin
- C** Curlew
- D** Greenfinch

**Read the text below and answer the questions 10 through 13.**

Have you ever wondered how you are able to remember things for a long time? How can you remember your own name or your phone number? How does your brain allow you to learn things in school? And where are those memories kept? These kinds of memories are called long-term memories, and it is important to understand that memory works in three major steps. The first step is known as encoding, or processing new information. After the information is processed by the brain, it can be retained, or stored as a memory. The third step is called retrieval, which is when you remember the memory. All of these steps happen in the brain, but how does the brain do it?

Memories all start as new information. When you experience or learn something new, your brain processes this new information based on what it means or how it looks, sounds, and feels. Here's an example of how this works. Try to memorize this list of words: school, truth, computer, bravery, pizza. May be it's easier for you to remember the words school, computer, and pizza. This is because your mind might have also thought of images of these things. Your brain processed these words based on what they mean and also how they look. For the words truth and bravery, your brain probably processed them only based on what they mean. Now that your brain has processed this list of words, it can be stored in your brain as a memory.

Some memories are kept for a short time, like the list of words you just memorized. Other memories are kept for a long time, like facts you've learned in school, how to use a computer, or memories from when you were eight years old. These are long-term memories. Memories are stored in different parts of the brain, but the memories of events in your life are mostly stored in a special part of the brain called the hippocampus. The hippocampus is located in the temporal lobe, which is one of the four lobes of the brain. Events in your life include your first day in school and times you've spent with a friend.

After your memories are stored, you can access them later. Accessing a memory is what happens when you remember it. People can remember memories in different ways. One common way people remember an event in their lives is when they experience something connected with the memory. For example, imagine you became friends with someone at a playground that's far from home, and you had a great time playing there that day. Since then, this friend has become your best friend. Now, you are passing the playground for the first time since that day. As you look at the playground, you remember playing there and meeting your best friend. It feels like you jumped back in time. In this example, there is a connection between the playground and the memory of playing there with your best friend, but memories can be connected to anything. Specific sounds, smells, or words are commonly connected to memories.

The human brain is an incredible and complex organ, but there is still much more to learn about it. Scientists continue to study the different ways that parts of the brain work together. They are constantly learning more about how human memory and learning works.

**Q10. What are the three major steps of how memory works?****A** process, access, complex**B** fight, flight, freeze**C** school, computer, pizza**D** encode, retain, retrieve

**Q11.** According to the example in the text, how might the way your brain processes the words school, computer, and pizza compared to the way it processes truth and bravery?

- A** School, computer, and pizza are more important than truth and bravery so your brain will pick them to remember.
- B** It is easier for your brain to remember things that you can taste, so it is more likely to remember school, computer, and pizza.
- C** It is easier for your brain to think of images for school, computer, and pizza which may make them easier to remember.
- D** School, computer, and pizza are shorter than truth and bravery so it is easier for your brain to remember those words.



**Q12.** What conclusion can you draw from this evidence about the types of things that are more likely to become long-term memories?

- A** Random strings of words or numbers are more likely to become long-term memories.
- B** All the things you learn on a computer are more likely to become long-term memories.
- C** Important events and information are more likely to become long-term memories.
- D** Specific details, like the colors of walls, are more likely to become long-term memories.



**Q13.** Where would your brain store the memory of your 10th birthday party or your first water polo game?

- A** amygdala
- B** hypothalamus
- C** prefrontal cortex
- D** hippocampus

**Q14.** This boomslang snake is swallowing a frog. Boomslang snakes can use their fangs to inject venom into their prey. But like other snakes, boomslang snakes do not have teeth that they can use to chew their food.

Instead, snakes swallow their prey whole. Snakes have a flexible esophagus that helps them take in whole food.



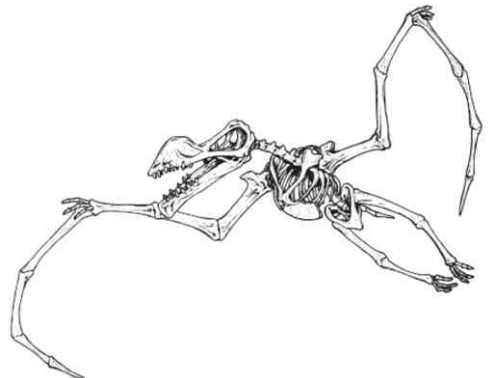
**How does a flexible esophagus help a snake take in whole food?**

- A** A flexible esophagus can stretch around whole prey and push the prey from the mouth to the stomach.
- B** A flexible esophagus can digest whole prey quickly.
- C** A flexible esophagus can stretch around whole prey and push the prey from the stomach to the small intestine.
- D** All of the above.



**Q15.** Which of these can best be concluded about the animal that this fossil came from?

- A** It had the ability to fly.
- B** It was a plant eater.
- C** It hunted at night.
- D** It traveled in a pack.





**Q16. Which of the following could be the root cause of food insecurity?**

**A** Chronic hunger

**B** Poverty

**C** Malnutrition

**D** Deficiency of vitamins and minerals

**Q17. Which of the following is not a benefit of plastic recycling?**

**A** None of the given options

**B** Clearing of landfills spaces

**C** Energy can be conserved

**D** Conservation of National resources

**Q18. Fatima wants to recycle her office E-waste.  
Which is the correct order of the stages she should follow?**

1. Shredding and Sorting
2. Collecting and Transportation
3. Magnetic Separation
4. Dust Extraction
5. Water Separation
6. Purification of Waste Stream

**A** 1,4,2,5,3,6

**B** 1,2,3,4,5,6

**C** 4,1,3,2,5,6

**D** 2,1,4,3,5,6

**Q19. Solar energy is a perpetual and an important renewable resource, and there are some factors which affect the efficiency of solar power. According to this statement find out the option which is not considered as a factor influencing solar power to produce electricity.**

**A** Characteristics of solar panels

**B** Soiling

**C** Bore depth

**D** Intensity of temperature

**Q20.** Consider the statements A and B and choose the correct options.

**Statement A:** Wind is a source of energy which is non-contaminating and inexhaustible, the turbines make power without utilizing petroleum derivatives and works without delivering greenhouse gases and substances or radioactive or harmful material.

**Statement B:** Wind turbines don't produce a similar measure of power constantly. There will be occasions when they produce no power by any means.

**A** Statement A is incorrect and B is correct.

**C** Both statements are correct.

**B** Statement A is correct and B is incorrect.

**D** Both statements are incorrect.



**Q21.** The passage below describes an experiment. Read the passage and identify the question that Mateo's experiment can best answer.

Mateo put one two-inch steel nail into each of six test tubes. He added water to three of the test tubes and vinegar to the other three. In each test tube, he completely covered the nail with the same volume of liquid. Mateo checked the nails for rust at the same time every day. He recorded how many days it took each nail to become completely covered in rust.

**A** Do steel nails rust in fewer days when submerged in a large volume of liquid compared to a small volume?

**B** Do steel nails take fewer days to rust in water compared to vinegar?

**C** Do steel nails rust in fewer days when submerged in a large volume of vinegar compared to a small volume?

**D** All of the above.

- Q22.** The passage below describes an experiment. Read the passage and identify the question that Joe's experiment can best answer.



Joe set up five pairs of platform bird feeders around his yard. He filled one feeder in each pair with sunflower seeds and the other feeder with flax seeds. For one week, Joe watched cardinals visiting the feeders during the same hour each morning. During his observations, Joe counted the number of visits by cardinals to feeders with sunflower seeds and the number of visits by cardinals to feeders with flax seeds.

- A** Do cardinals eat more seeds per visit from feeders containing sunflower seeds compared to feeders containing flax seeds?
- B** Do cardinals visit feeders containing sunflower seeds more often than feeders containing flax seeds
- C** Both of the above.
- D** None of the above.

**Q23.** Fatima leaves a glass jar of cold tea outside in full sunlight. When she goes to get it, she notices that the tea is warm. She wonders what factors affect how warm a liquid gets from sitting in the sunlight. So, she decides to design an experiment. She has the following supplies available:

- Two identical glass jars
- Two jar lids
- Tap water
- A measuring cup
- Two thermometers

**Using only these supplies, which question can Fatima investigate with an experiment?**

**A** When placed in the sun, will eight ounces of water in a glass jar or eight ounces of water in a plastic cup get warmer?

**B** Will eight ounces of carbonated water or eight ounces of tap water get warmer when placed in a jar in the sun?

**C** None of the above.

**D** All of the above.



**Q24.** The clay boat and clay ball have the same mass. Which property causes the boat to float and the ball to sink?

**A** color

**B** mass

**C** shape

**D** texture

**Q25. People often think of temperature as how hot or cold something is. But what exactly is temperature?**

**Temperature** is a measure of kinetic energy. Every substance is made up of particles. The temperature of a substance is related to the kinetic energies of these particles. If a substance is hot, its particles tend to have a large amount of kinetic energy.

The particles in a substance have kinetic energy because they are moving. The particles are constantly in motion, even if the substance does not appear to be moving.



**Select the statement that is true about the rubber ball shown above.**

- A** The temperature of the ball depends on the kinetic energies of the particles that make up the ball.
- B** If the ball is cold, its particles tend to have a small amount of kinetic energy.
- C** The particles that make up the ball are moving even when the ball is not.
- D** All of the above.



**Q26. Plants, animals, and all other organisms need energy from food to live and grow.**

How do organisms get energy from food? Inside an organism's cells, food molecules are broken down and rearranged through chemical reactions. The reactions release chemical energy that the cells can use to power growth and other important cell processes. These processes allow the entire organism to live and grow.

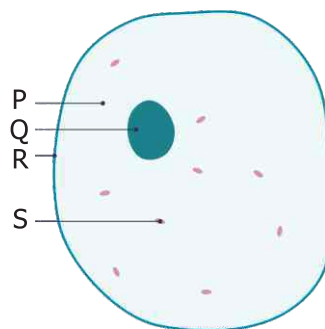
**Select the true statement.**

- A** Chemical energy can be used for cell growth.
- B** Molecules from food can provide energy.
- C** Animals need food, but plants don't.
- D** Both, A and B.



**Q27.** Which of the labeled parts of the cell is its controlling centre?

- A** P
- B** Q
- C** R
- D** S



**Q28.** Select the one true statement.

- A** The cell membrane stores nutrients, water and waste in a plant cell.
- B** In an animal cell, the endoplasmic reticulum helps ribosomes build proteins.
- C** Plant cells can have mitochondria but do not have vacuoles.
- D** All are true statements.

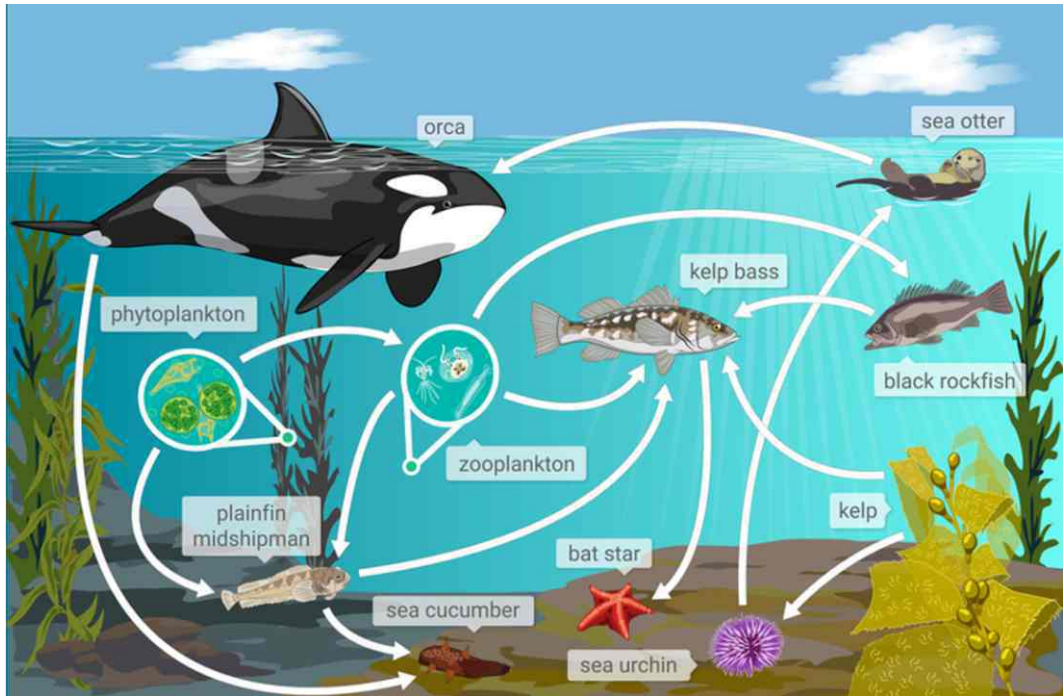
**Q29.** Dana and her brother each brought a burrito to a family picnic. The burritos were identical, but one was in a metal lunchbox and one was in a plastic lunchbox. This table shows how the temperature of each burrito changed over 2 hours.

Burrito	Initial Temperature (°C)	Final Temperature (°C)
Burrito in the metal lunchbox	80	33
Burrito in the plastic lunchbox	79	40

**The next time Dana brings a burrito to a picnic. she does not want it to cool down quickly. What should she do?**

- A** Use the metal lunchbox
- B** Use the plastic lunchbox
- C** Either, the rate of thermal energy transfer is the same whether the lunchbox is metal or plastic
- D** Use neither, both are poor conductors of heat

- Q30.** A food web models how the matter eaten by organisms moves through an ecosystem. The arrows in a food web represent how matter moves between organisms in an ecosystem. In this food web, which organisms contain matter that eventually moves to the sea cucumber?



- A** phytoplankton
- B** sea otter
- C** zooplankton
- D** All of the above

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[illegible]



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[illegible]

# Congratulations

## ICATS Art Contest 2022 National Toppers

Student Name	Father Name	Grade	School
HUMNA NADIR	M. NADIR IKRAM	1	FOUNDATION PUBLIC SCHOOL
HAIDER ALI	ALI MUSHTAQ	2	ARMY PUBLIC SCHOOL & COLLEGE
MUHAMMAD YOUSAF	KAMRAN ASHRAF	3	KOHSAR CHILDREN'S ACADEMY
MUHAMMAD ZAID	M. SOHAIB NIZAMI	4	GENERATIONS SCHOOL
HANIA ABID	MRS. ASMA LATIF	5	FATIMA FERTILIZER SCHOOL
RUQAIYAH ALI ASGHER	ALI ASGHER KHAMBATWALA	5	MSB EDUCATIONAL INSTITUTE
RAMISHA ALI	ABID ALI MUGHAL	6	GOVT. QUEEN MARY GRADUATE COLLEGE
SYEDA FATIMA SURIYA	SYED TAHIR HUSSAIN	7	BEACONHOUSE SCHOOL SYSTEM
MANAL ARSHAD	MUHAMMAD ARSHAD	8	HABIB GIRLS SCHOOL
MARYAM SHAHID	SHAHID IQBAL	9	BAHRIA COLLEGE
AREEBA KHAN	DURAIZ KHAN	10	PRESENTATION CONVENT HIGH SCHOOL

## ICATS Creative Writing Contest 2022 National Toppers

Student Name	Father Name	Grade	School
HASSAN WASEEM	M. WASEEM	1	PAKISTAN INT'L PUBLIC SCHOOL
M. AFNAN SUFDER	SUFDER HUSSAIN	2	ARMY PUBLIC SCHOOL AND COLLEGE SYSTEM
FATIMA NOOR	BILAL YOUSAF	3	LAHORE GRAMMAR SCHOOL
M. ABDULLAH HASSAN	RIZWAN AHMAD	3	LAHORE GRAMMAR SCHOOL
SHANZAY ADNAN	ADNAN FAROOQ	3	ARMY PUBLIC SCHOOL
PRATIK PARKASH	PARKASH LAL	4	THE CITY SCHOOL
DANIYAL SHAHZAD	SHAHZAD ASLAM	5	LAHORE GRAMMAR SCHOOL
HASSAN ALI	IMRAN ALI SHAH	6	ARMY PUBLIC SCHOOL & COLLEGE
MAIDA SOHAIL	SOHAIL AKRAM	7	BEACONHOUSE SCHOOL SYSTEM
ATIYA ATIF	MUHAMMAD ATIF NAZAR	8	ROOTS IVY INTERNATIONAL SCHOOL
AYESHA HAFEEZ	CH. GHULAM HAFEEZ	8	ISLAMABAD COLLEGE OF ARTS & SCIENCES
PARTHAM KUMAR	DOULAT RAM	9	AGA KHAN HIGHER SECONDARY SCHOOL
AMNA HUSNAIN	SYED ALI ZAFAR	10	AES SCHOOL FOR GIRLS
RASIKH JAVED	M JAVED	10	BAHRIA FOUNDATION COLLEGE

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if you are the best



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**CATS CONTESTS**  
COMPETENCE & APTITUDE TESTING SERVICES  
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## Answer Sheet

### INSTRUCTIONS

- This is a generic answer sheet to be used by participants of all grades. Students of Grade 1-2 will fill in circles of first 20 questions, Grade 3-4 will fill in circles of 25 questions and Grade 5-10 will fill in circles of 30 questions.
- Please recheck your Name, Father Name, Grade and School written below, the same would appear at your certificate. Make all corrections on the Attendance Sheet only.
- Use of lead pencil is not allowed. Use only Black / Blue ink to fill in the circles.

# ICATS Science Contest 2022 Grade 5-6

Choose only ONE of the FOUR proposed answers (A, B, C or D) and fill in the circle with your answer.

Example of correctly filled answer. (A) (B) (C) (D) Correct Filling Answer "C"

Q. No. Answer

- |    |                 |
|----|-----------------|
| 1  | (A) (B) (C) (D) |
| 2  | (A) (B) (C) (D) |
| 3  | (A) (B) (C) (D) |
| 4  | (A) (B) (C) (D) |
| 5  | (A) (B) (C) (D) |
| 6  | (A) (B) (C) (D) |
| 7  | (A) (B) (C) (D) |
| 8  | (A) (B) (C) (D) |
| 9  | (A) (B) (C) (D) |
| 10 | (A) (B) (C) (D) |

Q. No. Answer

- |    |                 |
|----|-----------------|
| 11 | (A) (B) (C) (D) |
| 12 | (A) (B) (C) (D) |
| 13 | (A) (B) (C) (D) |
| 14 | (A) (B) (C) (D) |
| 15 | (A) (B) (C) (D) |
| 16 | (A) (B) (C) (D) |
| 17 | (A) (B) (C) (D) |
| 18 | (A) (B) (C) (D) |
| 19 | (A) (B) (C) (D) |
| 20 | (A) (B) (C) (D) |

Q. No. Answer

- |    |                 |
|----|-----------------|
| 21 | (A) (B) (C) (D) |
| 22 | (A) (B) (C) (D) |
| 23 | (A) (B) (C) (D) |
| 24 | (A) (B) (C) (D) |
| 25 | (A) (B) (C) (D) |
| 26 | (A) (B) (C) (D) |
| 27 | (A) (B) (C) (D) |
| 28 | (A) (B) (C) (D) |
| 29 | (A) (B) (C) (D) |
| 30 | (A) (B) (C) (D) |