



INTERNATIONAL  
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**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 / ANSWERSHEET.
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.

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.

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



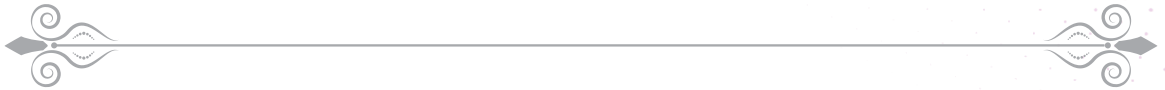
**Q3.** Which of the following statements is best supported by information in the passage?

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

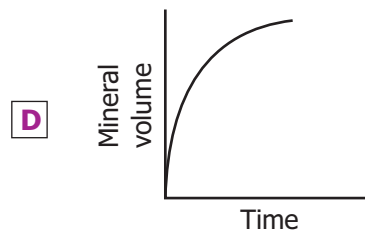
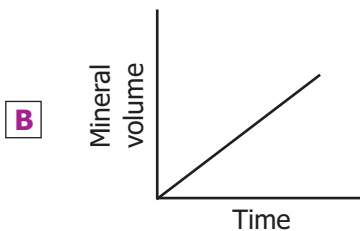
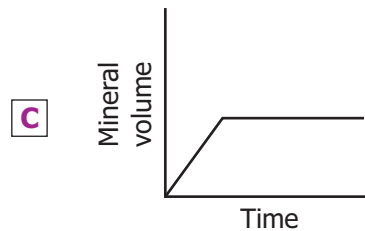
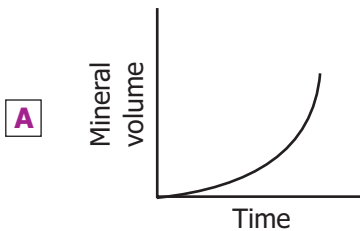
**B** | The age of fossilized plant species cannot be precisely estimated.

**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.

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

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

**C** | less clay than silt

**B** | more clay than sand

**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?

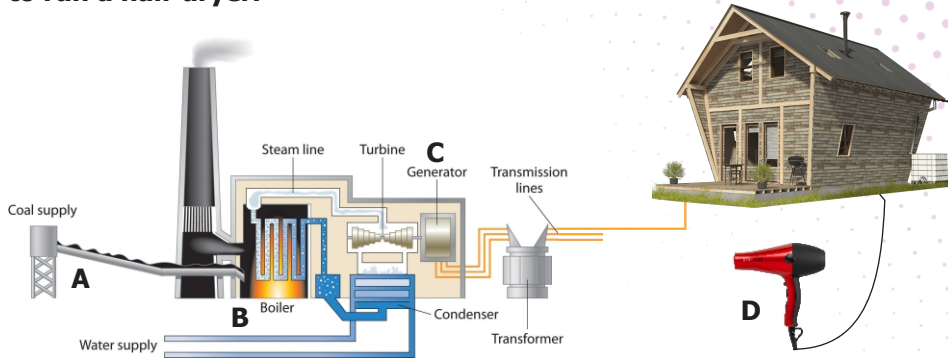
**A** | The baseball strikes the roof.

**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

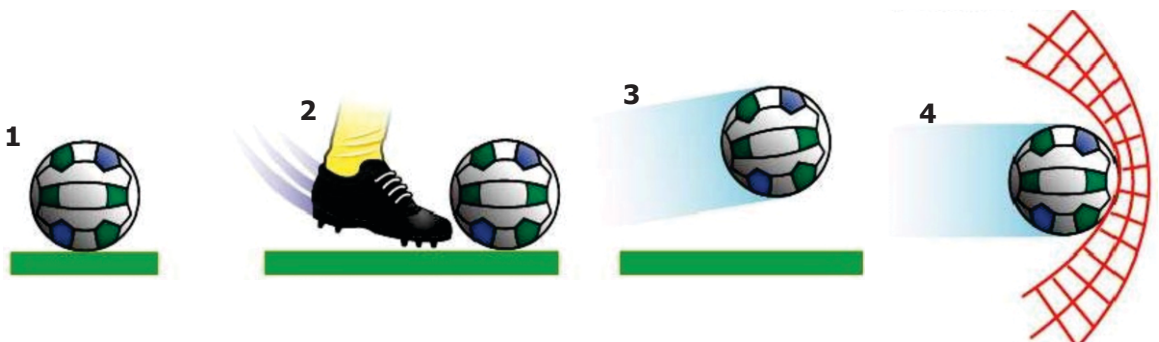
**A** | is converted to solar energy

**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.

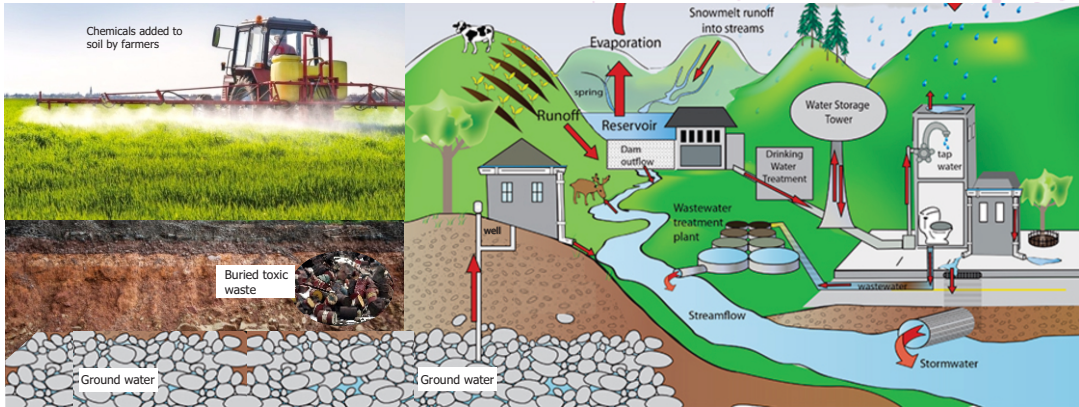
**B** | The motion of an object is constantly changing due to magnetic forces.

**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?**

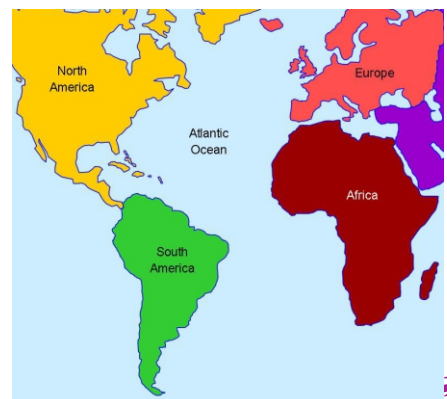
- A** | Chemicals applied by farmers lower the level of pollution in drinking water.
- B** | Drinking water can become polluted from unsuspected sources.
- C** | Human activities do not affect groundwater.
- D** | Toxic waste is safe if buried below the level of the basements of nearby homes.



**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

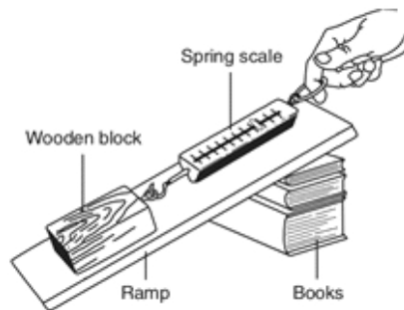
**D** | a black sweater

**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

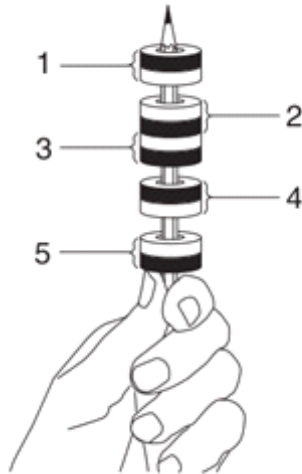
**B** | ocean tides

**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.



**Key**

Ring Magnet North Pole  
South Pole

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.

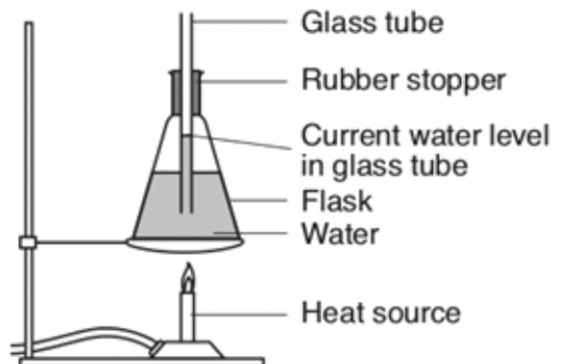
If heating continues, the water in the glass tube will most likely

**A** | turn into a solid

**B** | become more dense

**C** | move into the flask

**D** | rise higher in the tube









## 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 SHOOOL & 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**