ICATS
MATHEMATICS
CONTEST 2021

Question Booklet

GRADE 7 & 8
JUVENILES

Time Allowed: 90 Mins.
Maximum Marks: 90

INTERNATIONAL
CATS CONTESTS
COMPETENCE & APTITUDE TESTING SERVICES
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ICATS MATHEMATICS CONTEST 2021
JUVENILES (GRADE 7 & 8)
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

15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT INFO@CATSCONTESTS.ORG

Q1. If U is denoted by 7, M by 2, I by 5, O by 1, K by 8 and J by 4, then what will be the numeric form of the word MOUJIK when written in the reverse order?

A 217458   **B** 845712   **C** 854712   **D** 857412

Q2. If 'AND' is written as 'EQF' and 'THE' as 'XKG' then how will 'COM' be written?

A HRO   **B** GQO   **C** GRO   **D** GRN

Q3. How many letters of the word FAINTS will in their order in the word and that when the letters are arranged in the alphabetical order, remain at the same place?

A Two   **B** One   **C** Three   **D** Nil

Q4. A 25% fall is reversed.
What is the percentage rise?

A A 20% rise   **B** A 25% rise   **C** A 25.64% rise   **D** A 33.33% rise

Q5. Tiberius was Roman Emperor at the time of Jesus. Tiberius was born in November 42 BC and died in March 37 AD. How old was Tiberius when he died?

A 77 years   **B** 78 years   **C** 79 years   **D** 80 years

**Q6.** Which of the options given below will correctly complete the series?

**Q7.** Identify which option given below can be folded to make the 3D object in the picture shown below.

ICATS Mathematics Contest 2021 (Juveniles - Grade 7 & 8)

Q8. Below are two patterns created by a repetition of circles. For each of the patterns, identify the configuration of circles from which it has been created, from the set of options given below and then answer the question that follows.
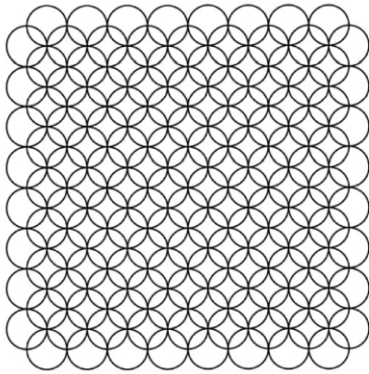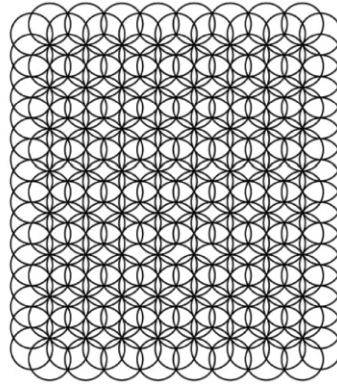

I   II

1   2   3   4   5   6   7

Which of the following statements is TRUE?

A I can be created from 3 and 4; and II can be created from 5 and 6

B I can be created from 1 and 2; and II can be created from 5, 6 and 7

C I can be created from 4; and II can be created from 6

**D** I can be created from 4 and 5; and II can be created from 6 and 7

Q9. Shown below is an image made from line segments. Identify the element, from the options at right, which is NOT part of the image.

A

C

B

D
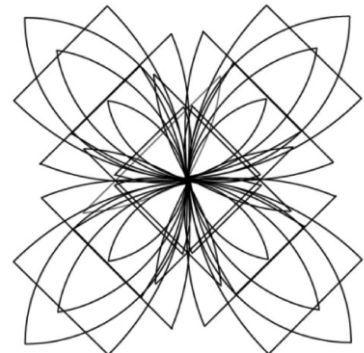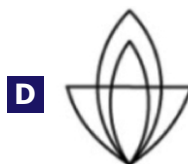
Q10. An empty glass with a straw in it is shown below. From the options given, identify the correct representation of the straw when the glass is half-filled with water.

A **B** **C** **D**
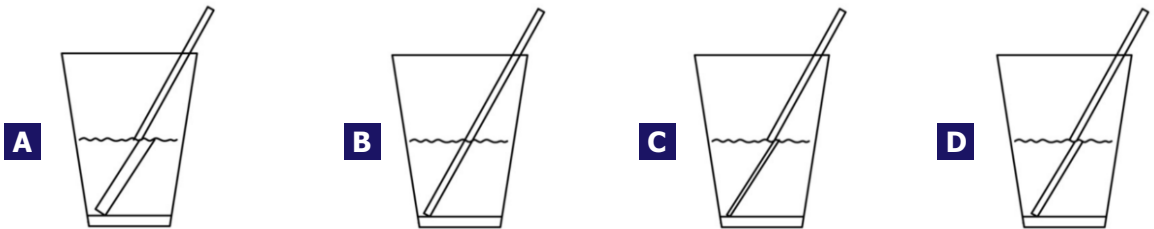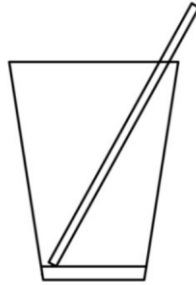
Q11. Privacy of a space depends on the level of closure it has from its surroundings i.e. the difficulty of accessing that space from outside the house. The figure below shows the plans of four houses at a village street junction. Which is the most private room amongst all the rooms across all the houses?
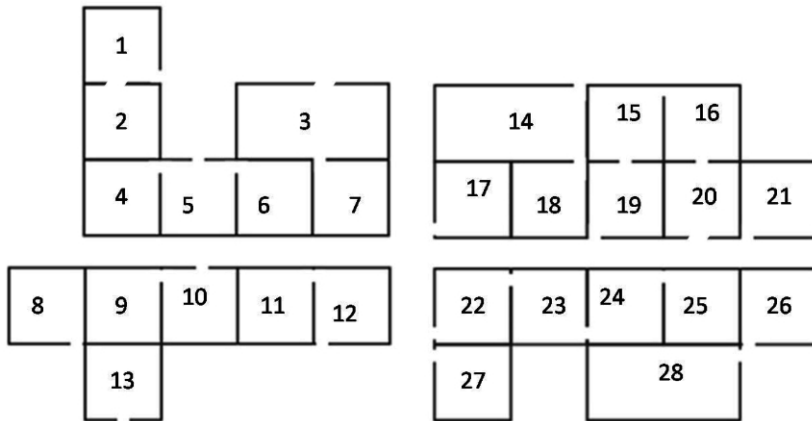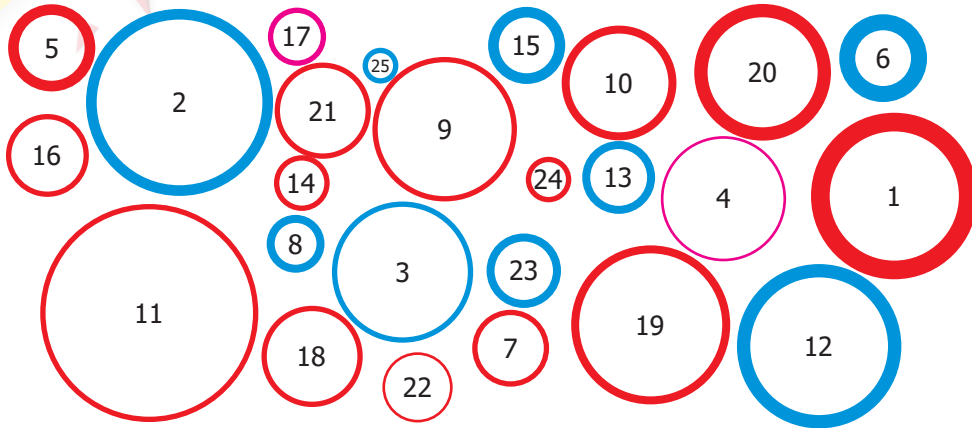
A 6 **B** 9 **C** 16 **D** 25

Q12. 30 circles are given below, with a set of following rules:
1. The bigger the circle, the farther away it is from us.
2. The thinner the line of the circle, the closer it is to us.
3. The red circles are farther away from us as compared to the blue circles.

Which of the options given below is TRUE?

A	Circle 25 is the closest to us	C	Circle 24 is closer to us than circle 14
B	Circle 25 is farthest from us	D	Both, option A and C are true

**Q13.** Shown below are two metal bolts. Suppose they were to be rotated (at the same rate) in the two directions as shown by the two arrows respectively, what would happen to the distance between the two bolt heads?
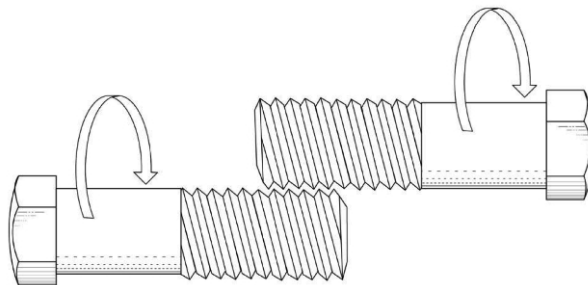
A	Move closer to each other	C	Remain at the same distance from each other
B	Move farther apart from each other	D	The bolts cannot be rotated

Q14. Figure to the left shows an unfolded pattern of a die. If four such identical dice are stacked one on top of another, as shown on the right, what is the sum of the numbers appearing on the faces which are parallel to the ground?
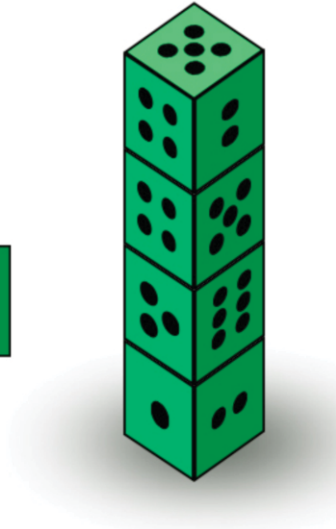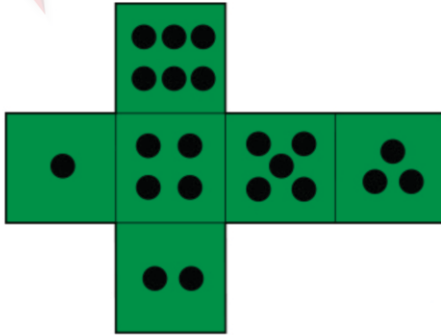
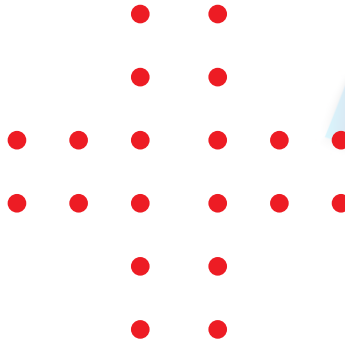

| A | 24 | B | 27 | C | 30 | D | 33 |

Q15 Twenty points are arranged on a plane as shown in the figure below. What is the highest number of squares that can be drawn using any four points as corners?


| A | 17 | B | 19 | C | 21 | D | 23 |

Q16. A family of four—grandfather, father, son and daughter—are caught in a heavy rain and are stranded at a bus stop close to their home. However they have only one umbrella with them.
The umbrella can take a maximum of two people without either of them getting wet. The four members of the family take different times to walk from bus stop to home. The grandfather is slowest of all, taking 10 minutes, followed by the father who takes 5 minutes. The son takes 2 minutes, while the daughter takes only a minute. What is the minimum total time (in minutes) for all four members of the family to reach home without any of them getting wet?

A 13　　　　　**B** 15　　　　　**C** 17　　　　　**D** 19

Q17. A rolled yellow paper cylinder is rotating clockwise direction at a constant rate of 1 revolution / 60 seconds. A pencil is touching the paper cylinder and is moving from T1 to T2 in 10 seconds and stops for 10 seconds. Then it moves to T3 in next 40 seconds (total time=60 seconds) as shown in the figure below. What would be the graph on paper when it is unrolled?
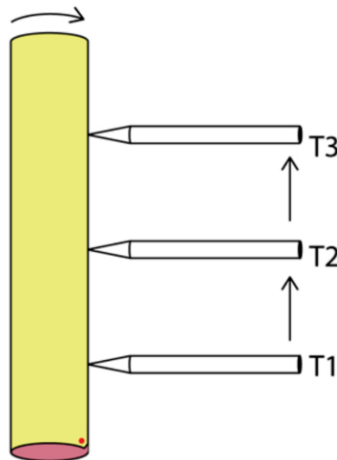
A　　　**B**　　　**C**　　　**D**

Q18. An opaque circular disc is parallel to the table top. A beam of sunlight casts its shadow on the table top as shown in the figure. Which of the options represents the shape of the shadow as seen in the top view of the table?

Sunlight

A

B

C

D
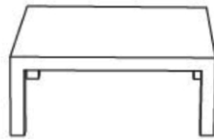
Q19. Which red shape from the options will match the white shape in the figure, using simple rotation.

A

C

B

D
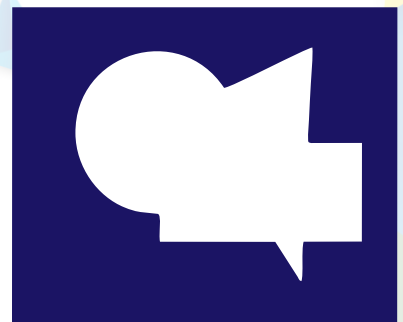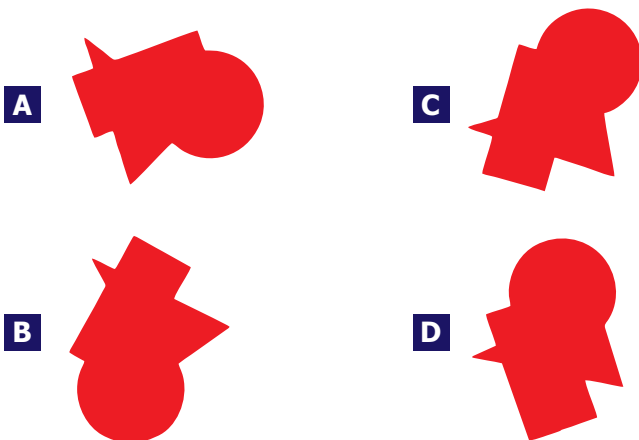
Q20. Yesterday, the temperature at noon was 13.4°F. By midnight, the temperature had decreased by 15.7 degrees. What was the temperature at midnight?

A -2.3 °F   **B** -11.4 °F   **C** -15.7 °F   **D** -27.1 °F

Q21. During a sale, a store offered a 40% discount on a particular camera that was originally priced at $450. After the sale, the discounted price of the camera was increased by 40%. What was the price of the camera after this increase?

A $252   **B** $360   **C** $378   **D** $450

Q22. Gary buys a $3\frac{1}{2}$ pound bag of cat food every 3 weeks. Gary feeds his cat the same amount of food each day. Which expression can Gary use to determine the number of pounds of cat food his cat eats each year? (1 year = 52 weeks)

A $\frac{7}{2} \times \frac{52}{3}$ **B** $\frac{7}{2} \times \frac{3}{52}$ **C** $3\left(\frac{1}{2} \times \frac{3}{52}\right)$ **D** $3\left(\frac{1}{2} \times \frac{52}{3}\right)$

Q23. The school bus Hina rides is scheduled to arrive at her stop at 8:20 a.m. each day. The table below shows the actual arrival times of the bus for several days that were randomly selected over the past few months.

Based on these data, what is the probability that the bus will arrive at Hina's stop before 8:20 a.m. tomorrow?

A $\frac{3}{10}$ **C** $\frac{7}{20}$

B $\frac{1}{3}$ **D** $\frac{13}{20}$

BUS ARRIVAL TIMES (a.m.)

8:21	8:21	8:19	8:20	8:23
8:22	8:20	8:18	8:20	8:18
8:21	8:20	8:19	8:17	8:25
8:20	8:20	8:18	8:19	8:24

Q24. Each sales associate at an electronics store has a choice of the two salary options shown below.

- $115 per week plus 9.5% commission on the associate's total sales

- $450 per week with no commission

The average of the total sales amount for each associate last year was $125,000. Based on this average, what is the difference between the two salary options each year? (52 weeks = 1 year)

A $4,262.11

B $5,545.00

C $10,956.90

D $11,525.00

Q25. Travis, Jessica, and Robin are collecting donations for the school band. Travis wants to collect 20% more than Jessica, and Robin wants to collect 35% more than Travis. If the students meet their goals and Travis collects $43, how much money did they collect in all?

A $106.78

B $128.60

C $136.88

D $144.99

Q26. A dealer paid $10,000 for a boat at an auction. At the dealership, a salesperson sold the boat for 30% more than the auction price. The salesperson received a commission of 25% of the difference between the auction price and the dealership price. What was the salesperson's commission?

A $750

B $1,750

C $3,250

D $5,500

Q27. Malika and Adrian prepared containers of potato salad at a deli. Each container was supposed to have a mass of one pound. The manager selected a random sample of containers prepared by each employee to check the mass of each container. The results are shown in the table below.

MASS OF EACH CONTAINER

Malika's Containers (pounds)	Adrian's Containers (pounds)
1.10	1.30
1.08	1.21
1.05	0.79
0.95	0.90
0.98	0.88

Which inference is best supported by these data?

A Malika will produce more containers with a mass of exactly one pound than Adrian will.

B Adrian will produce more containers with a mass of exactly one pound than Malika will.

C Most of Malika's containers will have a mass closer to one pound than most of Adrian's containers.

D Most of Adrian's containers will have a mass closer to one pound than most of Malika's containers.

Q28. Salid bought 35 feet of window trim at a hardware store. The trim cost $1.75 per foot, including sales tax. If Salid paid with a $100.00 bill, how much change should he has received?

A $20.00   **B** $38.75   **C** $61.25   **D** $80.00

Q29. Three friends own a landscaping business. The number of hours each friend spent on the same project is shown in the table below.

HOURS WORKED ON LANDSCAPING PROJECT

Name	Hours Worked
Asif	$17\frac{1}{4}$
Ali	$18\frac{1}{4}$
Ahmad	$14\frac{1}{2}$

In total, they earned $850 for the job. They put 15% of this amount into a joint savings account for further expenses. They then divided the rest proportionally based on the numbers of hours each worked. How much money did Ahmad receive?

A $209.53   **B** $240.83   **C** $283.48   **D** $295.11

Q30. Maya uses blue and orange fabric to make identical wall decorations. The graph below shows the relationship between the amounts of blue and orange fabric used.

FABRIC AMOUNTS
Blue Fabric (yards) vs Orange Fabric (yards)
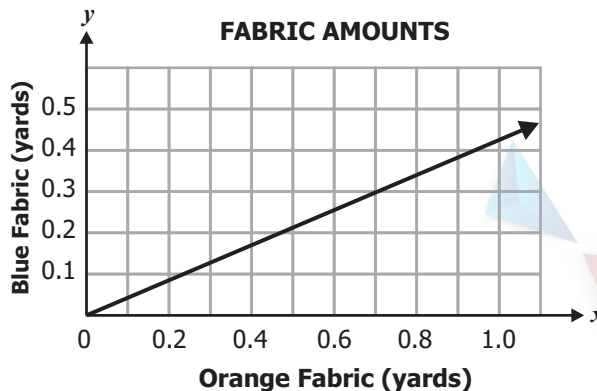
What is the constant of proportionality as shown in the graph?

A $\frac{3}{10}$ **B** $\frac{2}{5}$ **C** $\frac{3}{7}$ **D** $\frac{1}{2}$

National Toppers ICATS ART Contest 2020

Student Name	Father Name	Grade	School
MUNTAHA ABASSI	MUNEER AHMED	1	PAKTURK MAARIF INTERNATIONAL SCHOOL
EMAAN FATIMA NAQVI	SYED ARIF HUSSAIN	2	ARMY PUBLIC SCHOOL AND COLLEGE
MUHAMMAD UMAIR	YOUNAS MUHAMMAD MUGHAL	3	BEACONHOUSE SCHOOL SYSTEM
AHMED KHAN	M. BILAL KHAN	4	KARACHI CAMBRIDGE SCHOOL
FABIHA RASHID	M. RASHID	5	LAHORE GRAMMAR SCHOOL
AYESHA ARSHAD	RANA M. ARSHAD	6	PAKISTAN INTERNATIONAL PUBLIC SCHOOL
AREEBA AHMAD	MATEEN AHMED	7	KIPS SCHOOL
MANAHIL AHMED	KHAWAJA MUSHTAQ AHMED	8	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 14)
SHIFA NOORANI	SIRAJ NOORANI	9	LEADERSHIP SCHOOL
ESHA SALMAN	MUHAMMAD SALMAN BUTT	10	THE EDUCATORS

Congratulations

National Toppers ICATS Creative Writing Contest 2020

Student Name	Father Name	Grade	School
ALIYA HASNAIN	HASNAIN NAQVI	1	LAHORE GRAMMAR SCHOOL
AHMED KAMAL	MAJ. MUHAMMAD KAMAL	2	ARMY PUBLIC SCHOOL
BURHANUDDIN	M. HUSAIN KOTHARI	2	MSB EDUCATIONAL INSTITUTE
AMNA AZEEM	MUHAMMAD FAISAL	3	THE LEARNING CASTLE SCHOOL
ZARA KHALID	KHALID HAKIM	4	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 14)
HARIS A	ANWAR	5	PESHAWAR MODEL SCHOOL
KHADIJA HASNAIN	HASNAIN QADRI	6	LAHORE GRAMMAR SCHOOL
MERAL AZMAT	AZMAT KHAN	7	BEACONHOUSE SCHOOL SYSTEM
AMINA NOOR	MUHAMMAD JAHANGIR	8	FAUJI FOUNDATION MODEL SCHOOL
INSHAL	ISRAR KHAN	9	KOHINOOR GRAMMAR SCHOOL
AREESHA IMTIAZ	IMTIAZ ALI	10	HABIB GIRLS' SCHOOL

Congratulations

Compete
if you are the best