NATIONAL MATHEMATICS CONTEST SENIORS (GRADE 11 & 12)

ICATS
International CATS Contests

An Assessment Center
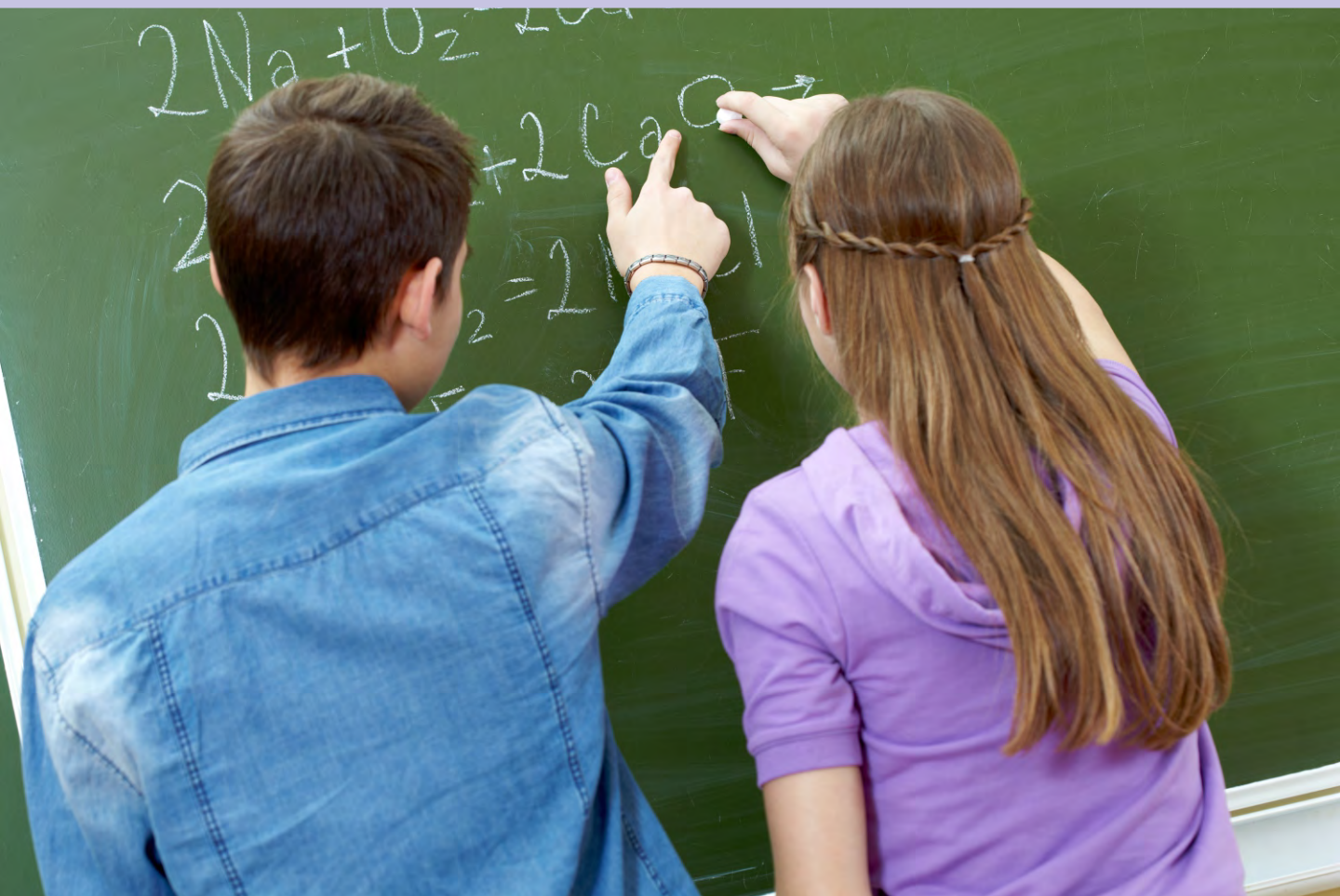
INTERNATIONAL
CATS CONTESTS
COMPETENCE & APTITUDE TESTING SERVICES

NATIONAL ENGLISH LINGUISTICS CONTEST

SENIORS (GRADE 11 & 12)

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. WRITE YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET ONLY.
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. THERE ARE SIX 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)
   F. SENIORS (GRADE 11 & 12 / A-LEVELS)
10. ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
11. 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.
12. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
13. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT WWW.CATSCONTESTS.ORG
14. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT INFO@CATSCONTESTS.ORG

Q1. In a race of 200 m, A can beat B by 31 m and C by 18 m. In a race of 350 m, C will beat B by:

A   22.75 m   B   25 m   C   19.5 m   D $7\frac{4}{7}$ m

Q2. Two trains, each 100 m long, moving in opposite directions, cross each other in 8 seconds. If one is moving twice as fast the other, then the speed of the faster train is:

A   30 km/hr   B   45 km/hr   C   60 km/hr   D   75 km/hr

Q3. How many kilogram of sugar costing Rs. 9 per kg must be mixed with 27 kg of sugar costing Rs. 7 per kg so that there may be a gain of 10% by selling the mixture at Rs. 9.24 per kg?

A   36 kg   B   42 kg   C   54 kg   D   63 kg

Q4. A number consists of two digits. If the digits interchange places and the new number is added to the original number, then the resulting number will be divisible by:

A   3   B   5   C   9   D   11

Q5. . What decimal of an hour is a second?

A   .0025   B   .0256   C   .00027   D   .000126

Q6. . If 2994 ÷ 14.5 = 172, then 29.94 ÷ 1.45 =?

A	0.172	B	1.72	C	17.2	D	172

Q7. The value of $[(10)^{150} \div (10)^{146}]$

A	1000	B	10000	C	100000	D	10^6

Q8. Find out the wrong number in the given sequence of numbers.
105, 85, 60, 30, 0, -45, -90

A	0	B	85	C	-45	D	60

Q9. At what time between 7 and 8 o'clock will the hands of a clock be in the same straight line but, not together?

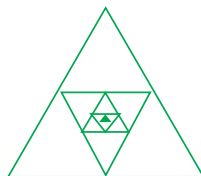| A	5 min. past 7	B	$5\frac{2}{11}$ min.past 7	C	$5\frac{3}{11}$ min.past 7	D	$5\frac{5}{11}$ min.past 7

Q10. The area of the external triangle is equal to 1. Its sides' midpoints are connected to form a second triangle, and so forth.
What is the sum of the areas of all the triangles in this infinite series?

A	4/3	B	1.25	C	1.5	D	5/6

Q11. *A person's present age is two-fifth of the age of his mother. After 8 years, he will be one-half of the age of his mother. How old is the mother at present?*

A	32 years	**B**	36 years	**C**	40 years	**D**	48 years

Q12. *In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?*

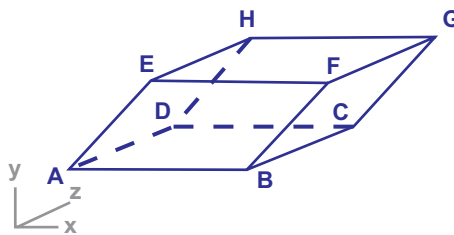| **A**	159	**B**	194	**C**	205	**D**	209

Q13. *Find the center of the prism with the following vertices.*
A(1,1,1), E(3,3,3),
B(5,1,1), F(7,3,3),
D(1,1,7) and H(3,3,9).

A	(4,2,6)	**B**	(4,2,5)	**C**	(5,2,4)	**D**	(5,2,5)

Q14. *I choose a 4-digit number in which the first digit is one-sixth the last, and the second and third digits are the last digit multiplied by 6.*
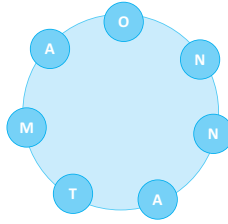
What is the sum of all digits?

A	24	**B**	16	**C**	20	**D**	36

Q15. *What is the word coiled inside this circle?*

A	African Country	B	US State	C	Delicious Fruit	D	Millionaire City

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Q16. *A software company is hiring some programmers to add to its development team. A junior programmer's salary is £ 32,000 and a senior programmer's salary is £56,000. To keep costs down, the total spending on these new positions must be under £570,000 annually. Select the inequality in standard from that describes this situation. Use the given numbers and the following variables.*

x - the number of junior programmers
y - the number of senior programmers

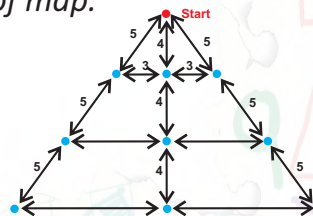| A	32,000 + x + 56,000 + Y< 570,000	B	32,000x + 56,000 y < 570,000
C	56,000 + x + 32,000 + Y < 570,000	D	56,000x + 32,000y <570,000

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Q17. *The traveling salesman problem: a salesman has to visit 9 towns and return home.*

What is the shortest available route between the towns?

Any route chosen must lie on the paths shown. Paths with unmarked distances should be calculated from the geometry of map.
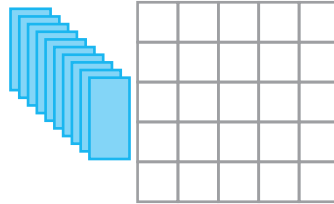

A	45	B	50	C	54	D	56

Q18. *On a 5 x 5 grid, I place a 1x2 card so that it exactly covers two squares.*
I continue until there is no place for a card.
There is no card overlapping and all cards are inside the grid.
What is largest number of empty squares I can leave at the end of the exercise?

| A | 5 | B | 7 | C | 6 | D | 8 |

Q19. *Gerry gave half of his money to Jane.*
Next day, she gave half of all her wealth to Gerry.
After the last exchange they each have exactly as much as the originally started with.
Who is richer?

| A | Jane is twice as rich as Gerry. | B | Gerry is twice as rich as Jane. | C | Jane is three times as rich as Gerry. | D | Jane and Gerry have the same amount of money. |

Q20. *The diagram shows some of the results of a six-person contest.*
There are two matches left for everybody.
An arrow pointing from one player to another signifies that the first player defeated the second player in the match. For example, player A defeated player C in their match.

Which player has the strongest opponents left to play?
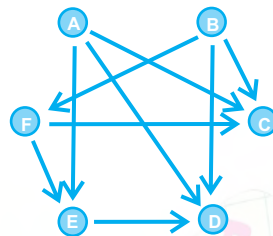
| A | B | B | A | C | C | D | D |

Q21. A tank is filled in 5 hours by three pipes A, B and C. The pipe C is twice as fast as B and B is twice as fast as A. How much time will pipe A alone take to fill the tank?

| A | 20 hours | B | 25 hours | C | 35 hours | D | Cannot be determined |

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Q22. A man walked diagonally across a square lot. Approximately, what was the percent saved by not walking along the edges?

| A | 20 | B | 24 | C | 30 | D | 33 |

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Q23. The value of $\dfrac{489.1375 \times 0.0483 \times 1.956}{0.0873 \times 92.581 \times 99.749}$ is closest to:

| A | 0.006 | B | 0.06 | C | 0.6 | D | 6 |

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Q24. The price of commodity X increases by 40 paise every year, while the price of commodity Y increases by 15 paise every year. If in 2001, the price of commodity X was Rs. 4.20 and that of Y was Rs. 6.30, in which year commodity X will cost 40 paise more than the commodity Y ?

| A | 2010 | B | 2011 | C | 2012 | D | 2013 |

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Q25. If $\left(\dfrac{a}{b}\right)^{x-1} = \left(\dfrac{b}{a}\right)^{x-3}$, then the value of x is:
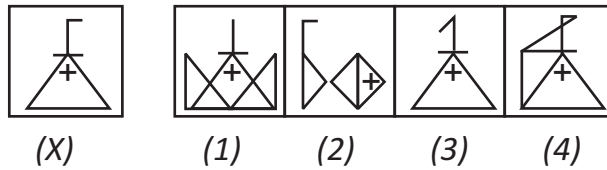
| A | 1/2 | B | 1 | C | 2 | D | 7/2 |

Q26. $$\frac{1}{1+x^{(b-a)} + x^{(c-a)}} + \frac{1}{1+x^{(a-b)} + x^{(c-b)}} + \frac{1}{1+x^{(b-c)} + x^{(a-c)}}$$

A	0	B	1	C	X^{a-b-c}	D	None of these

Q27. . If m *and* n *are whole numbers such that* $m^n = 121$, *the value of* $(m-1)^{n+1}$ *is:*

A	1	B	10	C	121	D	1000

Q28. Find out the alternative figure which contains figure (X) as its part.

(X)   *(1)*   *(2)*   *(3)*   *(4)*

A	1	B	2	C	3	D	4

Study the following figure and answer the questions (29-30)given below.
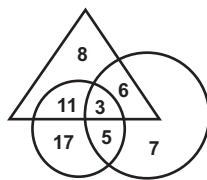
○ ⟶ Employed people

○ ⟶ Backward people

△ ⟶ Educated people

Q29. How many educated people are employed?

A	9	B	18	C	20	D	25

Q30. How many backward people are educated?

A	9	B	28	C	14	D	6