International Mathematics Assessments for Schools

2016 UPPER PRIMARY DIVISION FIRST ROUND PAPER

Time allowed：75 minutes

When your teacher gives the signal, begin working on the problems.

INSTRUCTION AND INFORMATION

GENERAL

1. Do not open the booklet until told to do so by your teacher.
2. No calculators, slide rules, log tables, math stencils, mobile phones or other calculating aids are permitted. Scribbling paper, graph paper, ruler and compasses are permitted, but are not essential.
3. Diagrams are NOT drawn to scale. They are intended only as aids.
4. There are 20 multiple-choice questions, each with 5 choices. Choose the most reasonable answer. The last 5 questions require whole number answers between 000 and 999 inclusive. The questions generally get harder as you work through the paper. There is no penalty for an incorrect response.
5. This is a mathematics assessment, not a test; do not expect to answer all questions.
6. Read the instructions on the answer sheet carefully. Ensure your name, school name and school year are filled in. It is your responsibility that the Answer Sheet is correctly coded.

THE ANSWER SHEET

1. Use only pencils.
2. Record your answers on the reverse side of the Answer Sheet (not on the question paper) by FULLY filling in the circles which correspond to your choices.
3. Your Answer Sheet will be read by a machine. The machine will see all markings even if they are in the wrong places. So please be careful not to doodle or write anything extra on the Answer Sheet. If you want to change an answer or remove any marks, use a plastic eraser and be sure to remove all marks and smudges.

INTEGRITY OF THE COMPETITION

The IMAS reserves the right to re-examine students before deciding whether to grant official status to their scores.

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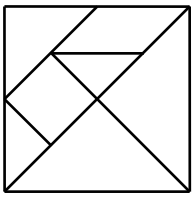
Questions 1-10, 3 marks each

1. What is the value of $162+1620+6201+2016$?
   （A）9459　（B）9639　（C）9819　（D）9999　（E）10089

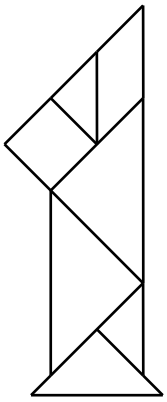
2. Which of the following five expression is correct?
   （A）$1.2\times3.4=12\times3.4$　（B）$0.98\times0.99>0.99$　（C）$\frac{1}{2}-\frac{1}{3}<\frac{1}{3}-\frac{1}{4}$
   （D）$10.4\times0.1<1.04$　（E）$1.1\times1.1>1.1$

3. The diagram below shows the seven pieces in the classic Chinese puzzle called Tangram.

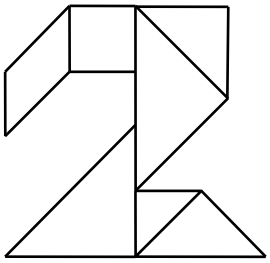


Which of the following five figures is not composed with a set of Tangram pieces?

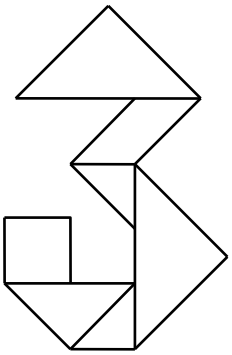
（A）



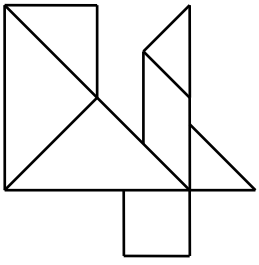
（B）



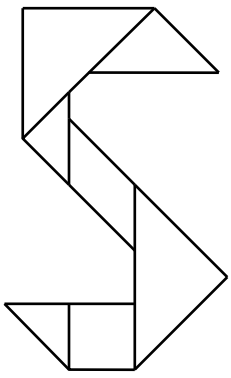
（C）



（D）

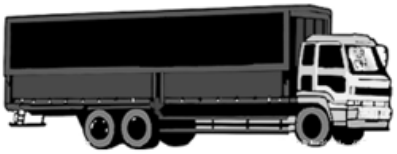


（E）

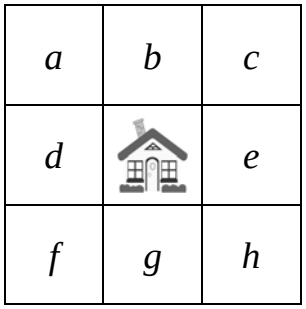


4. A large truck can carry 6.3 tons and costs 1000 dollars to rent. A small truck can carry 2.1 tons and costs 400 dollars to rent. To transport 12.6 tons, how much cheaper if only large trucks are rented, compared with only small trucks are rented?

（A）100　（B）200　（C）250　（D）350　（E）400




5. Mick is in one of the eight squares round a house, and the house is to his north-west. On which square is Mick?



（A）*a*　（B）*c*　（C）*f*　（D）*h*　（E）*d*

6. The table below summarizes the results of a test in a certain class. What is the total score of this class?

Summary of the results of a test			
No. of students	The highest score	The lowest score	The average score
42	100	16	84.5

（A）672　（B）3528　（C）3549　（D）4200　（E）4872

7. How many positive common divisors do 192 and 120 have?

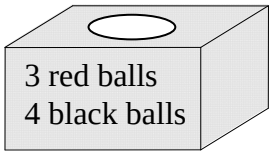
（A）1　（B）2　（C）6　（D）8　（E）10

8. In reading a story book, Lance reads one page more each day than the preceding day. On the fourth day, he reads 39 pages. After 9 days, he still has 48 pages to go. How many pages are there in this book?

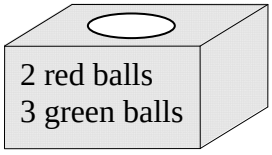
（A）351　（B）399　（C）360　（D）408　（E）432

9. The contents of the five boxes are labeled. A ball is drawn at random from each box. From which box is the drawn ball most likely to be red?

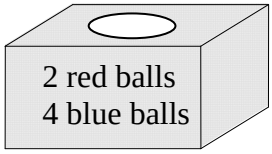
（A）



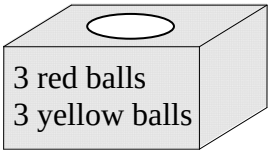
（B）



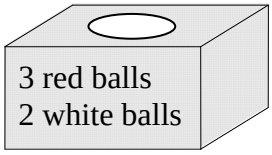
（C）



（D）



（E）

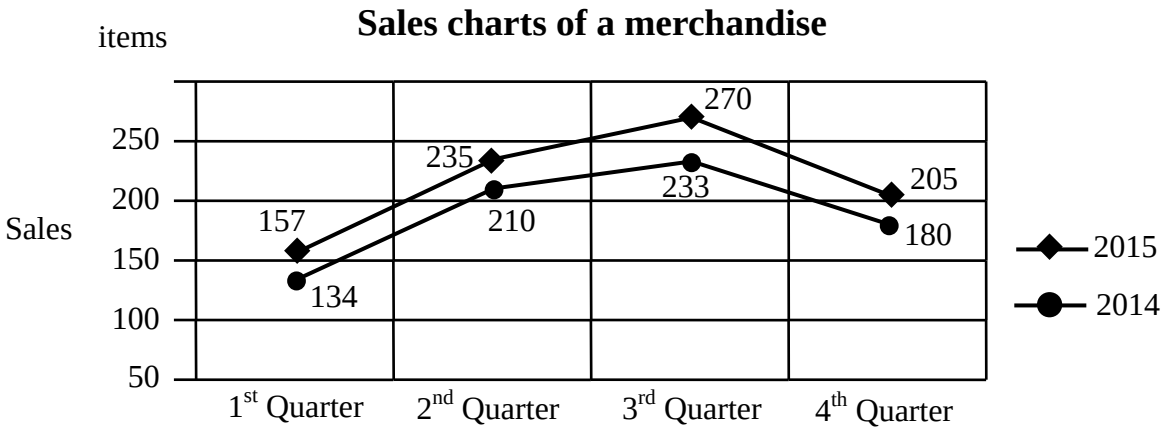


10. Gasoline costs 6 dollars per liter. A car uses up 8 liters for every 100 km. What is the largest integral number of km that can be covered with 200 dollars worth of gasoline?

（A）416　　（B）417　　（C）418　　（D）419　　（E）420

Questions 11-20, 4 marks each

11. The chart below shows the sale figures of a certain merchandise in 2014 and 2015 by the season. How many more items were sold in 2015 than in 2014?



（A）23　　（B）48　　（C）85　　（D）90　　（E）110

12. Fanny has 20 coins each worth 5 pence. Trading some of them for coins each worth 2 pence, she ends up with 32 coins. Then she trades some more 5-pence coins for coins each worth 1 penny, and now she has 56 coins. How many 5-pence coin does Fanny still have?

（A）5　（B）6　（C）7　（D）8　（E）9

13. Every pair of the numbers from 1 to n is added, and there are 215 different sums. What is the value of n?

（A）100　（B）105　（C）108　（D）109　（E）215

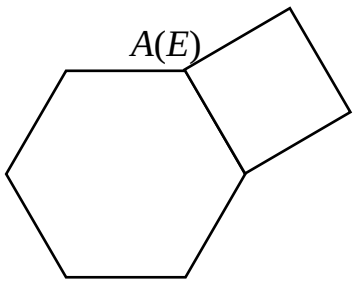
14. In a library, 12.1% of the books are fictions. After 1800 fictions and 2400 non-fictions go on loan, only 12% of the remaining books are fictions. How many books are there in the library initially?

（A）1296000　（B）1582200　（C）1800000　（D）1586400　（E）1291800

15. How many two-digit numbers are there such that when 304 is divided by the two-digit number leaving the remainder 24?

（A）5　（B）6　（C）7　（D）8　（E）9

16. On the table is a regular hexagon and a square. The side AB of the hexagon coincides with the side EF of the square. With the hexagon fixed, the square rotates about a common vertex until another side of the hexagon coincides with another side of the square. How many such rotations will it take to bring EF back to AB again?



（A）20　（B）18　（C）12　（D）10　（E）6

17. In a standard clock, the angle between two of its hands is the angle they form which is 180° or less. In which of the following five times will the angle between the minute and second hands be greater than or equal to the angle between the hour and the second hand?

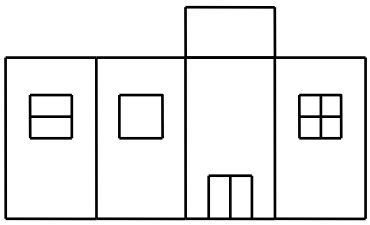
（A）06：00：15　　（B）10：10：30　　（C）12：30：18

（D）14：50：00　　（E）20：20：00

18. A sack of 5 kg of rice costs 48 dollars. A sack of 10 kg costs 92 and a sack of 25 kg costs 210 dollars. If we want the average cost per kg of rice to be 9 dollars, how many sacks of rice do we have to buy?

（A）4　　（B）5　　（C）6　　（D）7　　（E）8

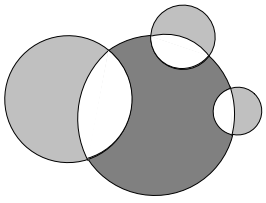
19. How many different rectangles (including squares) in different positions are there in the diagram below?



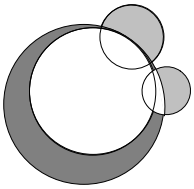
（A）25　　（B）26　　（C）27　　（D）28　　（E）29

20. In each of the five diagrams, there are four circles with respective radii 7, 6, 3 and 2 cm. For which diagram is the area of the non-overlapping part of the largest circle equal to the total area of the non-overlapping parts of the other three circles?

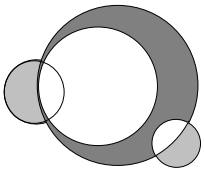
（A）



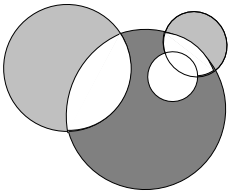
（B）



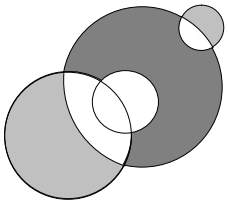
（C）



（D）



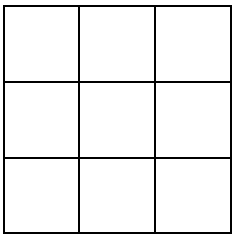
（E）



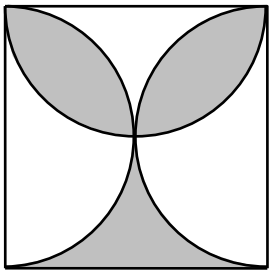
Questions 21-25, 6 marks each

21. Every student in a class is either in the mathematics club or the language club, and one third of them are in both. If there are 22 students in the language club, 4 less than the number of students in the mathematics club, how many students are there in this class?

22. The numbers 1 to 9 form a 3 by 3 table. The sum of every pair of adjacent numbers along a row or a column is computed. What is the largest total of these sums?



23. The diagram below shows a square of side length 20 cm, with three semicircle drawn inside it, with three of its sides as diameters. What is the area, in cm^2, of the shaded region?（Take $\pi = 3.14$）



24. The International Article Number has 13 digits *ABCDEFGHIJKLM*. Here *M* is a check digit. Let $S = A + 3B + C + 3D + E + 3F + G + 3H + I + 3J + K + 3L$. If *S* is a multiple of 10, then *M* is chosen to be 0. Otherwise it is chosen to be $M = 10 - t$ where *t* is the remainder obtained when *S* is divided by 10. The Code for a certain Article Number is 6901020□09017. What is the missing digit?

25. When a three-digit number is increased by 1, the sum is divisible by 15. When it is decreased by 3, the difference is divisible by 8. The sum of it and the number obtained from it by reversing the order of the digits is divisible by 10. What is this number?

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