

HMC 2013 - SECOND ROUND

BOOKLET - **A**

INSTRUCTIONS

- Before you start, make sure that your answer is filled accurately.
- Do not open this booklet until told to do so.
- This examination paper consists of 30 multiple choice questions. Each question is followed by answers marked A, B, C, D and E. Only one of these is correct.
- The final answers must be entered in the correct circle on the ANSWER SHEET which is supplied separately.
- Each correct answer is worth:
 - 4 marks in Part 1 (Questions from 1 to 15)
 - 6 marks in Part 2 (Questions from 16 to 30)
- There is a penalty, -1 mark, for every incorrect answer.
- Exam duration is 75 minutes and no extra time will be given.
- Calculators and geometric instruments are NOT permitted.
- Diagrams are NOT necessarily drawn to scale.
- Rough paper, pen, pencil, and rubber are permitted.
- Start when the invigilator tells you to do so. Good luck!

PART – I

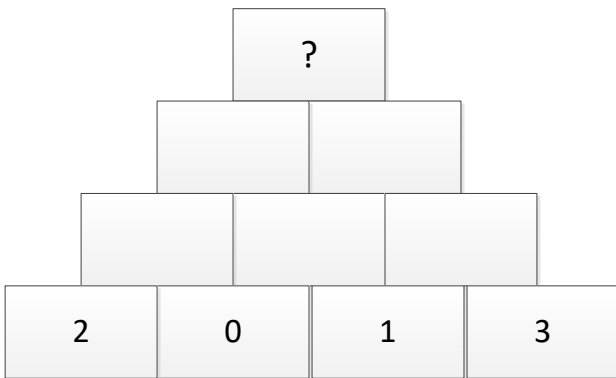
1) Which of the following is the smallest?

- A) 0,75 B) 0,075 C) 0,170 D) 0,017 E) 7,015

2) The digits of 2013 are arranged in decreasing order and then in increasing order. The difference between these two numbers is

- A) 3187 B) 3178 C) 3078 D) 3087 E) 3018

3) In each box you must write the difference (larger minus smaller) of the numbers in the two boxes below. What number is to be written in the top box?



- A) 2 B) 0 C) 1 D) 3 E) 4

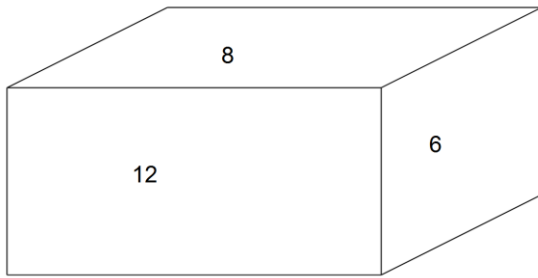
4) If $x \otimes y = x + y - x \div y$, then $8 \otimes 4$ is equal to

- A) 11 B) 12 C) 10 D) 14 E) 15

5) If 16% of a sum of money is R49, then the sum is

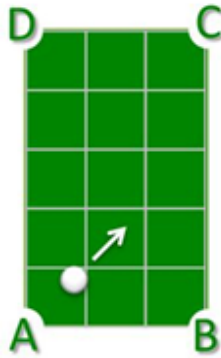
- A) R305.15 B) R403.00 C) R306.25 D) R500.25 E) R357.45

6) The areas of three faces of a rectangular box are 12, 8, and 6. The volume of the box is



- A) 24 B) 26 C) 48 D) 52 E) 576

7) I strike a pool ball from corner A of the rectangular billard table at an angle of 45° . In which corner pocket will the ball fall into?

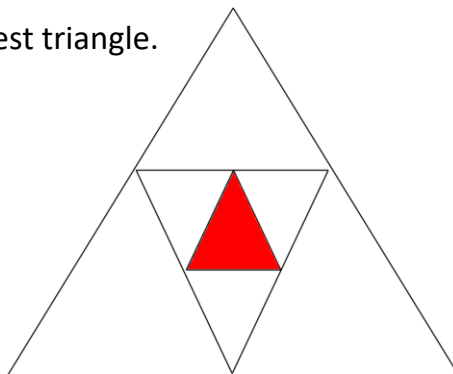


- A) A B) B C) C D) D E) None

8) If you buy 9 cold drinks from the Tuck Shop, you will get 1 free. In what percent does the cost of the cold drinks decrease, due to the free cold drink?

- A) %5 B) %10 C) %15 D) %20 E) %25

9) All the triangles in the shape are equilateral. If the perimeter of the shaded triangle is 12 cm, then find the perimeter of the biggest triangle.



- A) 36 B) 48 C) 60 D) 120 E) 72

10) If the sum of a and b is 17, then find the greatest possible product of a and b.

- A) 70 B) 66 C) 60 D) 48 E) 72

11) A number and a quarter of that number are added together to get 30. What is the number?

- A) 20 B) 21 C) 22 D) 23 E) 24

12) The angles of a triangle are in the ratio of 2:3:4. The size of the largest angle, in degrees is

- A) 90 B) 75 C) 85 D) 80 E) 100

13) There are 400 learners in a school and 325 are girls. If 40% of the boys play soccer, how many boys do not play soccer?

- A) 40 B) 45 C) 30 D) 35 E) 50

14) Eight learners went on a charity drive. Each learner collected R25 more than previous learner. How much did the third learner collect if the total amount collected was R1500?

- A) 100 B) 95 C) 125 D) 150 E) 175

15) Find the sum of digits of the product $99 \times 44 =$

- A) 18 B) 19 C) 14 D) 20 E) 15

PART - II

16) Three positive integers a , b and c are such that:

$axb=c$, $bx3=c$, $bxc=75$. Find the value of $axbxc=?$

- A) 100 B) 125 C) 225 D) 200 E) 150

17) Kyle is half as old as Tony, who is three times as old as Tom. If Tom's age is 10 then what is Kyle's age?

- A) 30 B) 20 C) 25 D) 10 E) 15

18) The three taps at a swimming pool run at different flow rates. Tap A can fill the pool in 30 min on its own, tap B in 20 min and tap C in 12 min. How long will it take to fill the pool if all three taps are open without reduction in pressure?

- A) 10 min B) 6 min C) 8 min D) 4 min E) 62 min

19) Let A , B , C , M , N , and K be the points where

$$[AB]+[BC]=[AC], \text{ and } [MN]+[NK]=[MK]$$

Which points are between two other points?

- A) A and B B) B and M C) C and K D) B and N E) None

20) Xolela wants to build the smallest square possible using tiles with dimensions $10\text{cm} \times 15\text{cm}$. How many tiles does he need?

- A) 6 B) 15 C) 10 D) 12 E) 30

21) Dimensions of a rectangular prism are given; 3cm, 4cm and 5cm.

Find the surface area of the prism.

- A) 60 B) 80 C) 76 D) 94 E) 120

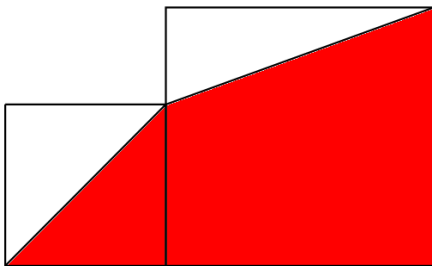
22) When Ali erases the middle digit of a 3-digit number he gets a 2-digit number which is one sixth of the first number. What is the sum of the digits of the 3-digit number?

- A) 15 B) 13 C) 11 D) 9 E) 6

23) If $3@5=24$, $7@6=91$, $2@8=20$, $6@5=66$. What will be $4@7=?$

- A) 11 B) 17 C) 22 D) 33 E) 44

24) A square with a side length of 3 units is placed next to a square with a side length of 4 units. How much is the total area of the shaded regions?



- A) 16 B) 20.5 C) 16.5 D) 12.5 E) 18.5

25) A steam train, 3km length, travels at 12km/h through a tunnel. If the tunnel is 6 km long, how long does it take for the entire train to travel through the tunnel?

- A) 30 min B) 15 min C) 45 min D) 1.5 hours E) 1 hour

26) Sia uses $\frac{5}{8}$ of a litre of milk to make a glass of milkshake. How many glasses of milkshake will she make from 40 litres of milk?

- A) 64 B) 25 C) 80 D) 50 E) 160

27) What whole number must be used in place of x , to make the statement below, true?

$$\frac{3}{5} < \frac{x}{7} < \frac{4}{5}$$

- A) 6 B) 5 C) 4 D) 3 E) 2

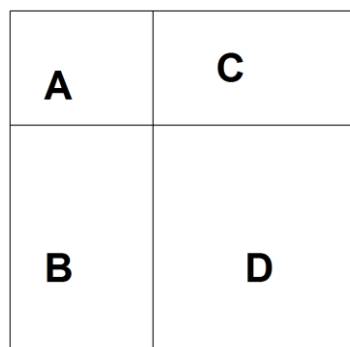
28) If $\frac{x}{y} = \frac{2}{3}$ and $\frac{z}{y} = \frac{4}{5}$, then determine $\frac{x}{z}$

- A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{6}{5}$ D) $\frac{1}{2}$ E) $\frac{5}{6}$

29) If $\frac{1}{3} = \frac{1}{A} + \frac{1}{B}$ where A and B are different whole numbers, what is the value of B+A=?

- A) 16 B) 20 C) 12 D) 24 E) 18

30) If the areas of rectangles A,B and C below are 12cm^2 , 15cm^2 , and 24cm^2 respectively, then find the area of rectangle D.



- A) 25 B) 30 C) 35 D) 40 E) 50

THE END

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One Learner – 10 A's
One Learner – 9 A's

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