MATHEMATICS OLYMPIAD GRADE SEVEN

DATE: 12 AUGUST 2024 – 16 AUGUST 2024

TIME: 90 MINUTES

INSTRUCTIONS:

1. This booklet has 15 multiple choice and 5 open ended questions.
2. Use the answer sheet provided.

   Circle the letter corresponding to your answer.
3. All working details must be done in the space provided.
4. Calculators are not permitted.
5. Diagrams are not necessarily drawn to scale.
6. The first 15 problems carry 1 mark each and the next 5 carry 2 marks each.
7. You have 90 minutes for the paper which works out to an average of 4.5 minutes per question.
8. Read the questions carefully before answering.
9. Visit the website: www.saolympiads.co.za.

GRADE SEVEN

1. Evaluate: $20 - 15 \div \frac{3}{4}$

   (A) 10 (B) 5 (C) 0 (D) 20

2. Write down the value of: 80 x 125 x 4

   (A) 36000 (B) 40000 (C) 44000 (D) 48000

3. When 300 is increased by 15% the answer is….

   (A) 345 (B) 350 (C) 355 (D) 360

4. Evaluate:

   777 + 555 + 333 + 444

   (A) 2409 (B) 2309 (C) 2209 (D) 2109

5. Determine:

   $\sqrt[3]{1728}$

   (A) 14 (B) 13 (C) 12 (D) 9

6. If 8 workers take 3 days to do 4 units of work then how many units can be done by 12 workers in 2 days working at the same rate?

   (A) 6 (B) 4 (C) 3 (D) 2

7. Determine the 30th term of this addition sequence.

   10; 16; 22; 28; …….

   (A) 184 (B) 190 (C) 196 (D) 202

8. In the following subtraction problem find A x B+C = ……

$$\begin{array}{r} A\ 5\ 6 \\ -\ \ B\ C \\ \hline 2\ B\ C \end{array}$$

(A) 42 (B) 36 (C) 29 (D) 33

9. Evaluate:

$\frac{17}{18}\ x\ 444 + \frac{5}{9} x\ 444 + \frac{11}{18} x\ 444\ - \frac{1}{9}\ x\ 444$

(A) 555 (B) 666 (C) 777 (D) 888

10. An oil tank is $\frac{3}{4}$ full. When 100 blocks measuring 100cm by 500 cm by 20cm are dropped into the tank, the oil level rises to $\frac{12}{15}$ of the tank. What is the capacity of the tank in kl? (Note: 1000 litres = 1 kl and $1cm^3$ = 1ml)

(A) 2000 (B) 2400 (C) 2500 (D) 2600

11. The following addition is done in base 7.

$$\begin{array}{r} 356 \\ 524 \\ 655 \\ \hline 2201 \end{array}$$

What is the answer to 456 + 365 + 444 in base 7?

(A) 2531 (B) 1631 (C) 1632 (D) 1661

12. Observe the following pattern:

4 6

8 10 12

14 16 18 20

.....

What is the 2nd number of the 25th row?

(A) 596 (B) 598 (C) 602 (D) 654

13. Lynn travelled from Pimrose to Landy. She covered $180km$ of the distance by car, $\frac{1}{2}$ the remaining distance by train. She still has 90km to travel. What is the distance in km between Primrose and Landy?

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(A) 320 (B) 360 (C) 400 (D) 440

14. Determine the value of: $1 + \frac{1}{1+\frac{1}{1+\frac{1}{8}}}$.

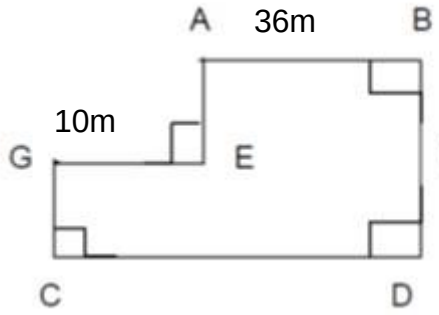
(A) $\frac{26}{17}$ (B) $\frac{25}{17}$ (C) $\frac{24}{17}$ (D) $\frac{23}{17}$

15. Calculate:

120 – 116 + 112 – 108 +.....+32

(A) 84 (B) 80 (C) 78 (D) 76

16. The cost of precast fencing this land is R300 per m and the total cost amounted to R48000. If GE = 10 metres; AB = 36 metres, then determine the length of BD (in metres).



17. A foreign exchange centre gave the exchange rates as follows:-

    3 dimes for 5 eunos

    5 garnets for 6 puros

    4 eunos for 6 garnets

    How many puros can one get for 1 dime?

18. How many minutes after 14:00, is the angle between the minute and the hour hand on an analogue clock 105^0?

19. Evaluate:

$$\frac{3+6+9+\cdots+96}{4+8+12+\cdots+128}$$

20. Plastic numbers from 20 to 40 are such that when 2 numbers are added at a time, they give an answer that is divisible by 9. How many such combinations are there?

MARKS: 1-15: 15 X 1 = 15
16-20: 5 X 2 = 10

TOTAL: 25