Candidate's Examination Number.............................

AN ROINN OIDEACHAIS

BRAINSE AN IARBHUNOIDEACHAIS

DAY VOCATIONAL CERTIFICATE EXAMINATIONS, 1971

MATHEMATICS—PAPER I

WEDNESDAY, 9th JUNE—9.45–11.45 a.m.

Instructions

(a) Before attempting to answer any question you should write your Examination Number in the space provided on top of this page and also on the blank paper provided.

(b) Final answers are to be written down in the spaces provided on this paper. Space is provided on the blank page for any other work you may wish to do.

(c) All questions may be answered and you should attempt as many as possible.

(d) Questions 1 to 10 carry 1 mark each, questions 11 to 30 carry 2 marks each.

(e) Mathematical Tables and Slide Rule may be used in answering this paper.

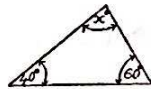1. Express 27·3846 correct to three significant figures.   Ans...............................

2. What is the largest three-figure number which can be written containing the numerals 2, 5 and 7?   Ans...............................

3. What is the ratio of 75p to £3 written in its simplest form?   Ans...............................

4. Calculate the value of x as shown in the diagram.

Ans...............................

5. What is the greatest common factor of 32 and 24?   Ans...............................

6. If $7^4 \times 7^5 \div 7^3 = 7^x$, what is the value of x?   Ans...............................

7. Which is the least of the following integers: 7, 3, –6, 0, 1, –4.   Ans...............................

8. Write in its simplest form the answer to the sum: $\dfrac{13}{18} + \dfrac{4}{9} + \dfrac{5}{6}$ Ans...............................

9. Write out the set A if $A = B \cap C$ where $B = \{1, 2, 4, 6, 7, 8, 9\}$ and $C = \{1, 3, 5, 7, 9\}$.   Ans...............................

10. Write out any decimal number which lies between 1·14 and 1·17.   Ans...............................

11. The coefficient of linear expansion of aluminium is 0·000023. If this number is written as $2·3 \times 10^n$ what is the value of n?   Ans...............................

12. What is 8% of £150?   Ans...............................

13. Multiply 2·12 by 0·4.   Ans...............................

14. What is the value of cos 44° 30′?   Ans...............................

15. Factorise as completely as possible $2x^2 + 6xy$.   Ans...............................

16. If st is parallel to bc find the value of $(x + y)$
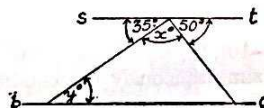
Ans...............................

17. Write the number 1101_{two} in the denary (tens) system.   Ans...............................

18. Use tables to find the value of M if log $M = 2·415$.   Ans...............................

19. Find the value of $\dfrac{x-3}{y+4}$ when $x = 18$ and $y = 1$.   Ans...............................

20. Write down the solution set of $(2x - 3)(x + 4) = 0$.   Ans...............................

21. Three non-collinear points a, b and c are shown in the diagram. Mark the point x such that that $(a, b) \uparrow (c, x)$.

$a \bullet$ $\bullet b$

$c \bullet$
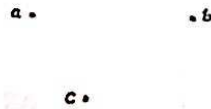
22. An aquarium tank is 50 cm long, 30 cm wide and 20 cm deep. How many litres of water can it hold?

Ans....................................

23. In the triangle shown the angle at c is a right angle, $|ab| = 13$ cm and $|bc| = 5$ cm. Calculate $|ac|$.

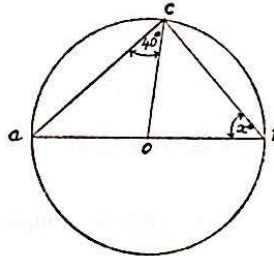Ans...............................

24. The petrol consumption of a car is given as 12 kilometres per litre. How many litres of petrol would be required for a journey of 90 kilometres?

Ans...............................

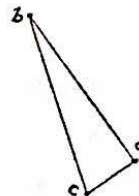25. What is the value of s when $t = \frac{1}{2}$ if $s = 16t^2 + 2t$?

Ans...............................

26. If o is the centre of the circle shown in the diagram and $[ab]$ is a diameter, calculate the value of x.
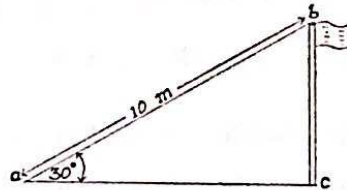
Ans...............................

27. Draw the image of the triangle abc by S_a (i.e. by central symmetry with point a as centre.)
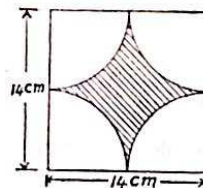
28. The guy rope, ab, of the flagstaff shown is 10 metres long and it makes an angle of 30° with the horizontal ground. What is the height, $|bc|$, of the flagstaff?

Ans...............................

29. A square of side 14 cm has quadrants of circles, whose centres are at the corners of the square, cut out. What is the area of the remaining part (i.e. the shaded area in the diagram)?

Ans...............................

30. (a) (1, 1), (b) (2, 1), (c) (5, –10), (d) (3, –5), (e) (1, 0). Which one of the above ordered pairs (x, y) satisfies simultaneously the conditions: $\{(x, y) \mid 6x + y = 13\}$ and $\{(x, y) \mid 5x + 2y = 5\}$?

Ans...............................