

FOR EXAMINERS USE ONLY	
Page I	
Page II	
Page III	
Page IV	
Page V	
Page VI	
Total	

CANDIDATE'S EXAMINATION NUMBER \_\_\_\_\_

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BRAINSE NA SCRÚDUITHE

DAY VOCATIONAL CERTIFICATE EXAMINATION 1978

MATHEMATICS - PAPER II

THURSDAY, 8 JUNE — 2 — 4 p.m.

INSTRUCTIONS

- Before attempting to answer any question you should write your examination number in the space provided on top of this page.
- This booklet is to be returned to the Supervisor at the end of this examination period.
- The total time allowed for this paper is 2 hours. You are allowed five minutes to read these instructions and to write your examination number on top of this page. You will then get 10 minutes to look through the questions but may not write down any answers during this time. You will then have 100 minutes in which to answer the questions and the remaining five minutes is for final checking.
- You will be given one mark for each question answered correctly in Section One and two marks for each question answered correctly in Section Two.
- Four suggested answers, A, B, C and D, are given for each question and only one of these is correct. You are required to select the correct response and to record it by encircling the letter opposite the right answer as shown in the following item:

- A. -1  
B. 1  
C. 7  
D. 12

You will not get credit for any answer unless it is marked in this way. No credit will be given if more than one response is thus marked. However if you make a mistake you may cancel the wrong answer by putting an X across it thus ~~X~~

- Answer as many questions as you can. If you find a question too difficult go on to the next, but go back and attempt it later if you have sufficient time and then choose the response which you judge most likely to be correct.
- If you wish to do any calculations or other work you may do it in this booklet but do not do it on the left hand side where the letters A, B, C and D appear.  
You may also carry out calculations on paper available from the Supervisor.
- The official Mathematical Table book may be used in answering this paper. Ask the Supervisor for the tables when you need them.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

OVER

SECTION ONE

1. The highest common divisor of 6, 12 and 18 is
  - A. 3
  - B. 6
  - C. 18
  - D. 36
  
2. An object travels 3600 m in 1 hour. Its average speed in metres per second is
  - A. 1
  - B. 2
  - C. 3
  - D. 36
  
3. Two sevenths ( $\frac{2}{7}$ ) of a number is 50, the number is
  - A. 25
  - B. 75
  - C. 175
  - D. 225
  
4.  $X = \{a, b, c, d\}$      $Y = \{d, e, f\}$     Then  $\#(X \cap Y)$  is
  - A. 1
  - B. 2
  - C. 4
  - D. 6
  
5. The square root of 133 is
  - A. 3.647
  - B. 11.53
  - C. 36.47
  - D. 66.5
  
6. Which of the following is the sum of the first five odd numbers?
  - A. 15
  - B. 25
  - C. 28
  - D. 30
  
7. Using the usual calculations the value of  $48 - 36 \div 6 + 4 \times 3$  is
  - A. 14
  - B. 18
  - C. 46
  - D. 54
  
8. Consider the number 479.126. The value of the figure six in the number is
  - A.  $\frac{6}{10}$
  - B.  $\frac{6}{100}$
  - C.  $\frac{6}{1000}$
  - D.  $\frac{6}{10000}$
  
9. A man 1.9 m tall casts a shadow of 1.5 m. In exactly the same conditions a tree 9.5 m tall will cast a shadow of length
  - A. 6.1 m
  - B. 7.5 m
  - C. 9.1 m
  - D. 12.9 m

10.  $(4y^3)^2$  is

- A.  $8y^3$
- B.  $8y^6$
- C.  $16y^3$
- D.  $16y^6$

11. The solution set of  $(x + 5)(x - 8) = 0$  is

- A.  $\{5, 8\}$
- B.  $\{5, -8\}$
- C.  $\{-5, 8\}$
- D.  $\{-5, -8\}$

12. When  $(x - 4)$  is multiplied by  $(x + 4)$  the answer is

- A.  $x^2 - 8$
- B.  $x^2 - 16$
- C.  $x^2 - 8x + 16$
- D.  $x^2 + 8x + 16$

13. The factors of  $a^2 + 6a - 27$  are

- A.  $(a - 9)(a - 3)$
- B.  $(a - 9)(a + 3)$
- C.  $(a + 9)(a - 3)$
- D.  $(a + 9)(a + 3)$

14. Given that  $m = 3$ ,  $n = -3$  and  $p = 0$  which one of the following statements is true.

- A.  $m \times n = 9$
- B.  $m \div n = 1$
- C.  $m + n + p = 6$
- D.  $p(m + n) = 0$

15.  $h$  is a divisor of which of the following

- A.  $hx^2 + h$
- B.  $h^2 + x^2$
- C.  $hx + x$
- D.  $hx^2 + hx + 4$

16. The sum of the binary numbers 1001 and 11101 is

- A. 10110
- B. 101110
- C. 100110
- D. 110110

17. A boy's pocket money is increased by 25%. If it was 30p, his pocket money now is

- A. 24p
- B. 36p
- C.  $37\frac{1}{2}$ p
- D. 55p

18. If  $\frac{161}{23} = 7$  then the value of  $\frac{16.1}{0.23}$  is

- A. 0.07
- B. 0.7
- C. 7
- D. 70

OVER

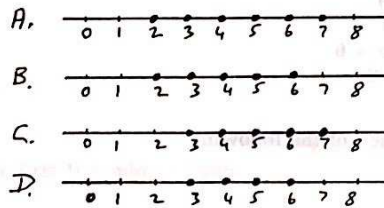
19. The average weight of four objects is 5 kg. If a fifth object is added then the average weight becomes 7 kg. The weight of the fifth object is
- A. 6 kg.
  - B. 7 kg.
  - C. 12 kg.
  - D. 15 kg.

20. £480 is divided among R, T and S. If R gets  $\frac{1}{4}$  and T gets  $\frac{1}{3}$  then S gets
- A. £120
  - B. £160
  - C. £200
  - D. £280

21. A joinery firm employs 60 craftsmen. One foreman is employed to oversee every 20 craftsmen. One apprentice is also taken on for every 5 craftsmen. What is the total number of people employed by the firm?
- A. 67
  - B. 75
  - C. 85
  - D. 87

22. If  $x = 3a - 2b$  and  $y = 4b - a$  then  $2x - 3y$  is equal to
- A.  $3a + 8b$
  - B.  $3a - 16b$
  - C.  $9a + 8b$
  - D.  $9a - 16b$

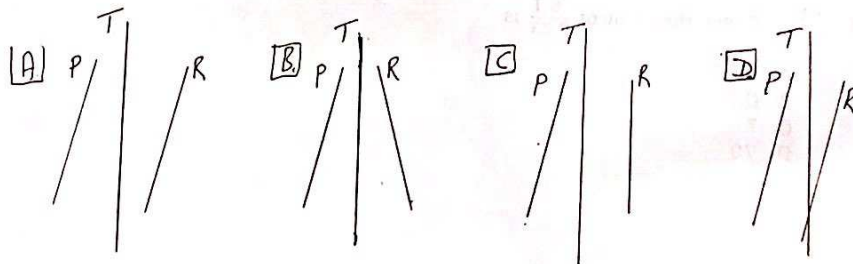
23. Which of the following graphs represent set M where  $M = \{x \mid 2 \leq x < 7\}$



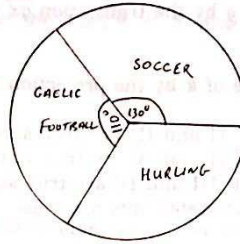
24. If two distinct lines M and N are parallel which one of the following is true
- A.  $M = N$
  - B.  $M \cap N = \emptyset$
  - C.  $M \cup N = \emptyset$
  - D.  $M \setminus N = \emptyset$

25. The image of a parallelogram under parallel projection is
- A. A point
  - B. A line segment
  - C. A triangle
  - D. A parallelogram

26. In which one of the following is the line T an axis of symmetry of the set  $P \cup R$ .



27. 3 apples cost the same as 4 oranges. A person buys 6 apples and 8 oranges for £1.44. The cost of an apple is
- 7p
  - 9p
  - 10p
  - 12p



The above pie-chart represents the number of students who play soccer, gaelic football or hurling in a school of 300 students. How many students play hurling.

- 60
  - 100
  - 120
  - 180
29. Given that  $\log 0.31 = \bar{1}.4914$ , then  $\log \sqrt{0.31}$  is
- 0.7457
  - $\bar{1}.2457$
  - $\bar{1}.7457$
  - 2.9828
30. A girl worked for  $x$  weeks at  $\text{£}y$  per week. Her expenses for the period were  $\text{£}z$ . Her savings (in  $\text{£}$ 's were).
- $x + y + z$
  - $xy \div z$
  - $z - xy$
  - $xy - z$

SECTION TWO

31. If  $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$ ,  $H = \{1, 2, 4, 5, 6, 7, 8\}$  and  $X$  a third set such that  $X \cap H = \{2\}$ . Then  $X$  is:— I.  $\{2\}$ , II.  $\{2, 3\}$ , III.  $H'$ , IV.  $U \setminus H$

The only correct statements above are:

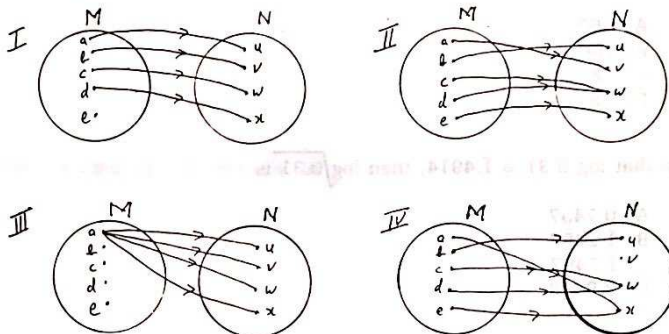
- I and II
  - I, II and III
  - I, II and IV
  - All four
32. Which of the following statements are true
- I.  $\log 1.74 = 0.2405$ , II. Anti-log  $1.74 = 14.93$ , III.  $(1.74)^2 = 30.28$ , IV.  $\sqrt{1.74} = 1.319$
- I and II
  - III and IV
  - II and III
  - I and IV
33. The couple  $(-1, 4)$  is the solution to which of the following pairs of simultaneous equations:
- I.  $\begin{cases} x - 2y = -9 \\ 2x + y = 6 \end{cases}$  II.  $\begin{cases} 3x + 2y = 5 \\ -2x + y = 6 \end{cases}$  III.  $\begin{cases} 2x - y = -2 \\ x + 3y = 11 \end{cases}$  IV.  $\begin{cases} -x + 4y = 17 \\ 3x - y = -7 \end{cases}$
- I and IV
  - II and III
  - I and III
  - II and IV

34.  $g, h,$  and  $k$  are three non-collinear points of  $\pi$ .  $x$  is the centre of the couple  $(g, h)$ . Consider the following statements:

- I. The image of  $g$  by the translation  $\overrightarrow{gx}$  is  $h$ .
- II.  $S_x(g) = h$ .
- III.  $(g, x) \uparrow (x, h)$
- IV.  $h$  is the image of  $k$  by the projection on  $gh$  parallel to  $kh$ .

- A. Only I, II and III are true statements.
- B. Only I, II and IV are true statements.
- C. Only II, III and IV are true statements.
- D. All four statements are true.

35. Which of the following arrow diagrams represent functions?



- A. I and III
- B. II and IV
- C. I and IV
- D. II and III

36. Consider each of following statements

- I.  $(0.02)^2 = 0.04$ .
- II.  $0.3 \times 0.2 = 0.06$ .
- III.  $\frac{0.9}{0.3} = 3$
- IV.  $(0.1 \times 0.5) \times 4 = 20$

- A. I and IV are correct statements
- B. II and III are correct statements
- C. II and IV are correct statements
- D. I and III are correct statements.

37. Given the formula

$$R = \frac{yz - x}{2} \text{ which two of the following forms may be properly deduced from this formula:}$$

- I.  $yz = 2R + x$ .
- II.  $z = 2R + x - y$ .
- III.  $2R = yz - x$ .
- IV.  $x = 2R - yz$ .

- A. II and IV
- B. I and III
- C. I and II
- D. III and IV.

38. Consider the following statements:

- I. If my age now is  $x$  years, my age in 20 years time will be  $20x$ .
- II. If petrol is sold at  $yp$  per litre, the cost of  $250 \text{ cm}^3$  is  $\frac{y}{4} p$ .
- III. A mother is five times as old as her daughter. If the daughter is now  $z$  years of age, her mother's age five years ago was  $z - 5$  years.
- IV. If an article was bought for  $\text{£}m$  and sold at a profit of  $\text{£}n$ , the selling price was  $\text{£}(m + n)$ .

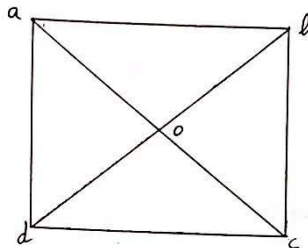
- A. Only I is a correct statement
- B. Only II and IV are correct statements
- C. Only I, II and IV are correct statements.
- D. All four are correct.

39. R, S, P and Q are four different lines. Which three of the following statements are true:

- I.  $R \perp S \parallel P \Rightarrow R \perp P$
- II.  $R \parallel S$  and  $S \parallel P \Rightarrow R \parallel P$
- III.  $R \parallel P$  and  $S \parallel Q$  always implies that the lines R, P, S, and Q form a parallelogram
- IV.  $R \perp P$  and  $P \perp Q \Rightarrow R \parallel Q$ .

- A. I, II, III
- B. I, II, IV
- C. II, III, IV
- D. I, III, IV.

40.  $abcd$  is a rectangle as in diagram with  $o$  the point of intersection of the diagonals. Consider the following statements.



- I.  $S_o(d) = b$ .
- II.  $S_{[ac]}(c) = a$ .
- III. The image of  $a$  under  $\vec{ad}$  is  $c$ .
- IV. The image of  $[bo]$  under a rotation of  $180^\circ$  centre  $o$  is  $[do]$ .

- A. I and II are correct statements
- B. III and IV are correct statements
- C. II and III are correct statements
- D. I and IV are correct statements

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If you have time to do so, go back and check your work and correct any mistakes you have made.

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