Mid-year Examination 1

Paper I (50 m) **Time: 1 h**

Instructions: Calculators are allowed for this paper. The number of marks for each question or part question is indicated in brackets [ ].

1. (a) List the odd numbers between 10 and 30 which are divisible by 3. [1]

Answer: _____

(b) Find the greatest even number which is less than a thousand, and is a multiple of 25. [1]

Answer: _____

2. (a) List all the prime numbers between 25 and 35. [1]

Answer: _____

(b) Express 438 as a product of prime factors. [1]

Answer: _____

3. (a) Find the value of $\sqrt{196}$ by using prime factorisation. [2]

Answer: _____

(b) Find the smallest value of n such that $196n$ is a perfect cube. [1]

Answer: _____

4. (a) Evaluate $0.09^2 \div (0.012 \div 0.25)$. [1]

Answer: _____

(b) What is the result of the expression in (a) if the brackets are removed? [1]

Answer: _____

5. Express

(a) 164 859 correct to the nearest ten thousand, [1]

Answer: _____

(b) 30.990 2 correct to 3 decimal places, [1]

Answer: _____

(c) 2 096 120 correct to 3 significant figures, [1]

Answer: _____

(d) 26.666 6 correct to the nearest hundredth. [1]

Answer: _____

6. Evaluate

(a) $5[24 + 80 \div 16 - 3 \times (-3)]$, [1]

Answer: _____

(b) $\frac{451 \div 11 \times 12}{15 + 198 \div 9}$ giving your answer correct to 4 significant figures. [2]

Answer: _____

7. (a) Find the HCF of 25, 50 and 75. [2]

Answer: _____

(b) Find the LCM of 12, 20 and 36. [2]

Answer: _____

8. (a) Arrange the following in ascending order. [2]

$-\frac{3}{7}, \quad -\frac{3}{8}, \quad -\frac{3}{6}$

Answer: _____

(b) Evaluate $\left(\frac{2}{3}\right)^2 - \left(\frac{3}{4}\right)^3$. [1]

Answer: _____

9. Factorise each of the following. [1]

(a) $9bf - 3b$

Answer: _____

(b) $\frac{1}{4}ab - \frac{1}{2}ac$ [1]

Answer: _____

10. Simplify each of the following.

(a) $4(3a + 2b) - 2(a + b)$ [2]

Answer: _____

(b) $3(2x - y) - (x + y) - 4(y + x)$ [2]

Answer: _____

11. Simplify each of the following.

(a) $\frac{1}{2} + \frac{a - c}{3} - \frac{2a}{4}$ [2]

Answer: _____

(b) $\frac{3}{4}(x - y) - \frac{1}{2}(2x + y)$ [2]

Answer: _____

12. (a) Evaluate $\frac{m(n+p)}{mn}$ when $m = 4$, $n = 3$ and $p = 2\frac{2}{3}$. [2]

Answer: _____

(b) If $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$, find x when $y = 4$ and $z = 3$. [2]

Answer: _____

13. Solve each of the following equations. [2]

(a) $10x - 8 = 13 + 3x$

Answer: _____

(b) $2.8y + 1.2 = 0.2(2y - 3)$ [2]

Answer: _____

14. Given that $A = \pi r^2$, find the value of r when $A = 154$ and $\pi = \frac{22}{7}$. [2]

Answer: _____

15. (a) Solve the inequality $-5m > 50$. [2]

Answer: _____

(b) Show the above solution using a number line. [2]

16. A linear graph is represented by $y = 4x - 5$.

(a) State the gradient of this graph. [1]

Answer: _____

(b) State the coordinates of the y-intercept. [1]

Answer: _____

(c) State the coordinates of the point at which the line cuts the x-axis. [1]

Answer: _____

Paper II (50 m) **Time: 1 h 15 min**

Instructions: Calculators are allowed for this paper. The number of marks for each question or part question is indicated in brackets [ ].

1. (a) Find the smallest number which has a remainder of 5 when divided by 13, 15 or 17. [2]

   (b) If $1\,800 \times 150 = 2^a \times 3^b \times 5^c$, what is the value of abc? [2]

2. Evaluate each of the following, giving your answers correct to 3 significant figures.

   (a) $\left(-1\frac{3}{4} \times 2\frac{3}{8}\right) + \left\{\left[4\frac{6}{7} \div \left(1\frac{1}{2}\right)^2\right]\right\}^2$ [2]

   (b) $\sqrt[3]{8.779 - 3.44} - (0.456)^2 \times (-1.348)$ [2]

3. A pile of 6 reams of paper is 187 mm high. Find the thickness of a sheet of paper, in mm, correct to 3 significant figures, if each ream has 480 sheets of paper. [3]

4. A triangular plot of land measuring 130.5 m, 67.5 m and 93 m is to be enclosed by hurdles. Find the longest possible length of each hurdle so that the number of hurdles used for each side is a whole number. [4]

5. At a Walk and Jog event, $\frac{1}{5}$ of the participants were men, $\frac{1}{4}$ were women and the rest were children. Of the children, 120 were girls and 133 were boys. What fraction of the participants were girls? [4]

6. (a) Subtract the sum of $(ac + 5ab - bc)$ and $(3ac + 2bc)$ from $(5ac - 3ab - 5bc)$. [2]

   (b) Given that $y = \frac{9}{5}x + 32$, find the value of x when $y = 212$. [3]

7. (a) By adding the same number to both the numerator and the denominator of $\frac{3}{5}$, the fraction becomes $\frac{4}{5}$. What is the number added? [3]

   (b) Given that $\frac{k + 6m}{2k - m} = 1\frac{4}{5}$, find the value of $\frac{k}{m}$. [3]

8. Jason has a total of 100 coins in his piggy bank. 10 of them were 20¢ coins and the rest were 50¢ coins and $1 coins. If the total value of the coins is $71, how many $1 coins does he has? [4]

9. The number of parents present at a 'Meet the Teachers' session was 7 times the number of teachers. Each of the parents and teachers was served a drink. The drinks were packed in cartons of 12. Altogether, 19 cartons were used and there were 4 drinks left over. How many parents were present during the session? [4]

10. Two workers, Ming and Meng, undertake to complete a job. If Ming works alone, he will take 5 hours to complete the job. If Meng works alone, he will take 6 hours to complete the job. How long will it take Ming and Meng to complete the job if both of them work together? Express your answer correct to the nearest 5 minutes. [4]

11. The sum of five consecutive whole numbers is 210. What are the numbers? [4]

12. A transport company charges a base fee of \$80 and an additional \$2 for every kilometre travelled. A graph showing the total charges (C) and the distance travelled (d) is shown below. Use the graph to write the equation linking C and d. [4]