READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. All questions must be answered.

2. Write your name and class on the top of your answer book.

3. Show ALL your working where possible.

4. It is in your interests to work neatly.

5. No calculators may be used for this examination.

QUESTION 1

1.1   Write down the next two numbers in these sequences:

      1.1.1   2; 4; 6; 8; …   (2)

      1.1.2   1; 4; 9; 16; ...   (2)

      1.1.3   2; -6; 18; -54; ...   (2)

      1.1.4   1; 8; 27; …   (2)

      1.1.5   1; 1; 2; 3; 5; ...   (2)

1.2   Use the following list of numbers to answer the questions that follow (A number may be used more than once):

$$91 \; ; 16 \; ; 7 \; ; \sqrt{3} \; \; ; 25 \; ; \; 225 \; ; \; 3 \; ; \; 60 \; ; \; 1$$

      1.2.1   List all the composite numbers in descending order.   (2)

      1.2.2   Which number is a cube number?   (1)

      1.2.3   Which number is an irrational number?   (1)

      1.2.4   List the multiples of 5.   (1)

      1.2.5   List all the prime numbers.   (1)

1.3   Write the number 225 as a product of its prime factors.   (2)

                                                                  [18]

QUESTION 2

2.1   Arrange the following fractions in ascending order:

$$\frac{9}{16};\frac{3}{4};\frac{5}{8}$$

(3)

2.2   Simplify the following:

2.2.1 $3\frac{7}{8}-1\frac{5}{4}$ (3)

2.2.2 $1\frac{1}{3}+2\frac{1}{6}$ (3)

2.2.3 $\frac{5}{8}\times\frac{24}{25}$ (2)

2.2.4 $\frac{3}{4}\div\frac{4}{3}$ (2)

2.3   Express $\frac{3}{5}$ as a decimal fraction.   (2)

[15]

QUESTION 3

3.1   Write the following ratios in simplest form:

3.1.1 $150:250$ (1)

3.1.2 $1,8\text{ kg}:3600g$ (2)

3.1.3 $R\,2,50:50c$ (2)

3.1.4 $\frac{3}{4}:\frac{36}{24}$ (2)

3.2   In 2013 one litre of petrol costs R14,00.

3.2.1   Determine how much it will cost to fill up a tank with a capacity of 40 litres.   (2)

3.2.2   Determine the capacity of a tank that can hold petrol to the value of R126.   (2)

3.3   The Maritzburg College school bus travels at an average speed of 60 km/h.

3.3.1   How far does the bus travel in 6 hours?   (2)

3.3.2 How many hours will it take the bus to travel 30 000 metres? (3)

3.3.3 If the bus travelled 120 km in 30 minutes, determine the speed at which the bus will be travelling? (3)

3.4 Calculate 35% of 200. (2)

3.5 If you wrote an assignment and achieved 20 out of 80, what is your mark as a percentage? (2)

3.6 There is a 10% discount off a shirt which has an original price of R20.

3.6.1 What percentage of the original price do you pay? (1)

3.6.2 How much money (in Rands) do you have to pay? (2)

3.7 Increase R250 by 20%. (2)

[28]

QUESTION 4

4. Simplify the following, showing ALL necessary working:

4.1 $(6+3)^2 + (9-10 \div 2)$ (2)

4.2 $4^2 + 2 \times 7^2 - 3$ (2)

4.3 $(-2+3) \times 4 + (-6)^2$ (2)

4.4 $-100 \div (-10 \times -1)$ (2)

4.5 $-3^2 - (6-2) - 2$ (2)

[10]

QUESTION 5

5.1 Write an algebraic expression for each of the following:

5.1.1 $17x$ decreased by 21. (1)

5.1.2 The quotient of d and b. (1)

5.1.3 The sum of a and the quotient of b and 5 (2)

5.1.4 The difference between 18 and six times y. (2)

5.1.5 The product of m and n is greater than or equal to p. (2)

5.2 Use the expression $6m^3 + 5m^2 - 4m + 8$ to answer the following questions:

    5.2.1 What is the constant in this expression? (1)

    5.2.2 What is the coefficient of m? (1)

    5.2.3 How many terms are in the expression? (1)

5.3 If $w = -1$, $x = 6$, y = 3 and z = -2, calculate the following:

    5.3.1 $\dfrac{3x - z}{-w}$ (3)

    5.3.2 $(y + z)^2 + (w - z)^2$ (3)

[17]

QUESTION 6

6.1 Simplify the following showing full working:

    6.1.1 $-11a + 3 \times 10a + 4ba - 8ba$ (2)

    6.1.2 $10r^2 - 32r \times 4r$ (2)

    6.1.3 $4m^2 \times 3 + 12m^3 \div 3m$ (3)

    6.1.4 $(-12a - 13a) + (-2hg) - 8gh$ (2)

    6.1.5 $-2x + 5k + 10x - 9k + 15x$ (2)

6.2 From $5x^2 + 3x - 8$ subtract $3x^2 - 6x + 4$. (4)

[15]

QUESTION 7

Simplify the following showing full working: Write your answer's with positive exponents.

7.1 $\left(x^7\right)^3$ (1)

7.2 $\left(x^4 y^2\right)^3$ (2)

7.3 $12w^6 x^3 y \times 12w^7 y^3 x^2$ (2)

7.4 $\dfrac{y^9}{y^3}$ (1)

7.5 $\left(3x^2\right)\left(4x^2\right)$ (2)

7.6 $u^4 u^3 u^6$ (1)

7.7 $\dfrac{\left(n^2 h^3 u\right)^2 + 4n^4 h^6 u^2}{15n^4 u^2}$ (4)

[13]

QUESTION 8

The Maritzburg College parents made some pies to sell at a rugby game to raise money for the new math books. The Maritzburg College Mathematics Department contributed four pies to the sale. Each pie was then cut into five pieces and sold. There were a total of 60 pieces to sell. How many pies did the College parents make? Show all your working.

[4]

Total Marks: 120