Section A

Multiple Choice **2 mark(s) per question** **30 Marks**

On the MCQ answer sheet provided, make a cross (X) over the alternative (a – d) that you have chosen for each question. There is only one right answer. There is no negative marking.

QUESTION ONE

If $a(b-1)=c$, then $b=$

a. $a-c$

b. $\frac{c+a}{a}$

c. $b(c-1)$

d. $c(a-1)$ (2)

QUESTION TWO

What is the coefficient of ab^2.

a. a

b. b

c. 1

d. 0 (2)

QUESTION THREE

Which of the following fraction is less than $2/3$.

a. $\frac{3}{4}$

b. $\frac{7}{8}$

c. $\frac{5}{7}$

d. $\frac{3}{5}$ (2)

QUESTION FOUR

Which of the following fraction is equal to $\frac{5}{6}$?

a. $\frac{40}{54}$

b. $\frac{25}{30}$

c. $\frac{2}{7}$

d. $\frac{15}{24}$ (2)

QUESTION FIVE

If $5t + 3t = -8$, then $t + 1 =$

a. 0

b. 2

c. -1

d. -2 (2)

QUESTION SIX

Lisa, Emmy, John and Jerry each worked the same maths problem. Each student's work is displayed below. Their lecturer noticed that two of the students had the correct answer, but only one of the student followed the right steps to the solution.

Lisa's work

$x^3x^{-7} = \frac{x^3}{x^{-7}} = x^{10}.$

John's work

$x^3x^{-7} = \frac{x^3}{x^7} = \frac{1}{x^4}.$

Emmy's work

$x^3x^{-7} = \frac{x^3}{x^{-7}} = x^{-4}.$

Jerry's work

$x^3x^{-7} = \frac{x^3}{x^7} = x^4.$

Which is a completely correct solution?

a. Jerry's work

b. Lisa's work

c. Emmy's work

d. John's work (2)

QUESTION SEVEN

Expand: $(6x^2 - 2)(6x + 2)$.

a. $36x^4 + 12x^2 + 12x - 4$

b. $36x^2 - 4$

c. $36x^3 + 12x^2 - 12x - 4$

d. $36x^3 - 4$ (2)

QUESTION EIGHT

Which of the following shows that $12t^2 - 147$ is factored completely?

a. $(3t - 7)(4t + 2)$

b. $3(2t - 7)(2t + 7)$

c. $12(t - 7)(t + 7)$

d. $(4t - 21)(3t + 7)$ (2)

QUESTION NINE

Which is expression shows the complete factorisation of $25u^2 - 40uv + 16v^2$.

a. $(5u - 4v)^2$

b. $(5u + 10 - 4v)^3$

c. $5(4uv)^2$

d. $5(5u - 4v)^2$ (2)

QUESTION TEN

Sandra made a 15% profit on the sale of a dress, and the original cost of the dress was R15,000. The dress sold for how much?

a. $R15{,}870.88$

b. $R16{,}540.44$

c. $R17{,}250.00$

d. $R15{,}980.55$ (2)

QUESTION ELEVEN

What is $\frac{4x^2-16}{x^2-2x}$ reduced to lowest terms?

a. $\frac{4(x+2)}{x}$

b. $\frac{4(x-2)}{x}$

c. $\frac{x-2}{x}$

d. $\frac{x+2}{x}$ (2)

QUESTION TWELVE

Simplify the radical: $\sqrt{18} + \sqrt{50}$.

a. $2\sqrt{10}$

b. $2\sqrt{8}$

c. $8\sqrt{2}$

d. $2\sqrt{68}$ (2)

QUESTION THIRTEEN

The total cost(c) in rand of renting a room for n days is given by the equation: $c = 56 + 2n$. If the total cost was R1260, for how many days was the room rented?

a. $n = 658$

b. $n = 659$

c. $n = 604$

d. $n = 602$ (2)

QUESTION FOURTEEN

If Jane buys 3 balls for R5.40, what will be the total cost of 7 balls?

a. $R12.60c$

b. $R37.80c$

c. $R9.07c$

d. $R15.60c$ (2)

QUESTION FIFTEEN

A doctor has 12 000 patients. 4560 of these patients are male, what percentage of these patients are female?

a. 38%

b. 35%

c. 62%

d. 69% (2)

SUBTOTAL: [30]

Section B

Calculations **70 Marks**

Show all workings answer the following questions in your answer book.

QUESTION ONE

1.1 **Simplify** the algebraic expressions:

a. $c + c + c =$ (1)

b. $e + f + e + f + e =$ (1)

c. $2a + 3a =$ (1)

1.2 **Add:** the algebraic expressions:

$(6x^2 + 5x - 6) + (-8x^2 - 3x + 5)$ (3)

1.3 **Subtract:** the algebraic expressions: (3)

$(-2x^2 + 6x + 1) - 2(4x^2 - 3x + 1)$

1.4 **Divide**: $\frac{5x^3y + 20x^2y^2 + 20xy^3}{5xy}$ (3)

1.5 Determine the degree of the following algebraic expressions: (3)

a. $xz^6 + 3x^2z^2 - 4x^5z + x^9$

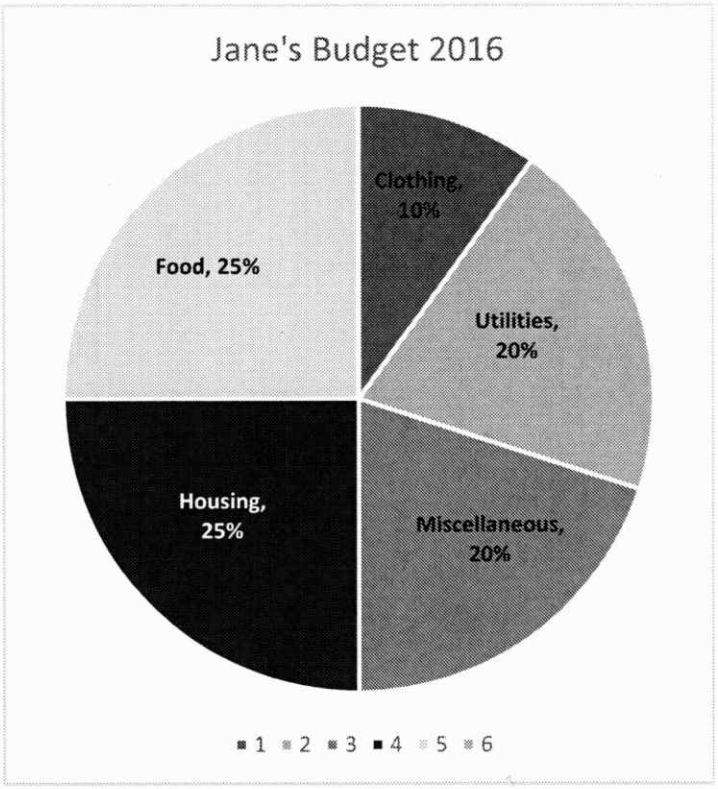
b. $y^{15} - 2x^{13} - 4x^{10}y^8$

c. $-5a^{12}b^2c^2 + 10^{17}$

[15]

QUESTION TWO

2.1 Jane's Monthly Earnings from January – June 2016 is shown by



Jane's Monthly Earnings from January – June 2016

January	R2578
February	R2432
March	R2668
April	R2490
May	R2622
June	R2555

2.1.1 How much money did Jane's budget allow for housing in April of 2016? (3)

2.1.2 What was the **average amount** of money that Jane's budget allowed for **clothing** the first six months of 2016? (3)

2.1.3 If Jane only spent 20% instead of the 25% allotment for food in May of 2016, how much money did she save? (3)

2.2 Tumi and Brian bought a medium pizza that has 8 slices. If Tumi ate $\frac{2}{4}$ slices and Brian ate $\frac{3}{8}$, who ate more pizza? (2)

2.3 Write these five fractions in order of size. Start with the smallest fraction. (2)

$\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{2}{3}$, $\frac{1}{6}$

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QUESTION THREE

3.1 Multiply the following algebraic expressions:

a) $x^3(x^4 + 5a)$ (2)

b) $(t + 5)(a - 6)$ (3)

c) $(2x + 3)(x^2 - x - 5)$ (3)

d) $(y - 3)^2$ (4)

3.2 Factorise the following:

a) $px + py + qx + qy$ (3)

b) $2x^3y - 12x^2y + 10xy$ (3)

c) $7a^2 - 35ab + 42b^2$ (2)

[20]

QUESTION FOUR

4.1 Evaluate the following expressions using the laws of exponents:

a) $\frac{3(x^2 + y^2)^{\frac{1}{2}}}{24(z^2 + t^2)^{\frac{1}{2}}} \times \frac{(z^2 + t^2)^2}{18[(x^2 + y^2)^{\frac{1}{2}}]^3}$ (3)

b) $\frac{334x^4y^7z^3}{668xy^8z^2}$ (3)

4.2 Simplify the following by rationalizing the denominator

a) $\frac{4\sqrt{2} - 5\sqrt{3}}{\sqrt{3} - \sqrt{2}}$ (4)

b) $\frac{2}{3\sqrt{2} + \sqrt{5}}$ (4)

[14]

QUESTION FIVE

5.1 Simplify the following fractions completely:

a) $\frac{a^2+4a}{a+3} \times \frac{a^2-9}{a^2+a-12}$ (3)

b) $\frac{4(x+y)}{5x^2y^3} \div \frac{-2x-2y}{10}$ (3)

5.2 The sum of two numbers is 25. One of the numbers exceeds the other by 9. Find the numbers. (2)

[8]

SUBTOTAL: [70]

TOTAL: [100]