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### Section A

Multiple Choice

2mark(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.

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#### QUESTION 1

Evaluate  $10 \div 5 - 4 \div 2 + 15 \div 3 + 2.5$

- a. 7,5
- b. 11
- c. 6,5
- d. 15

(2)

#### QUESTION 2

Evaluate  $\frac{(3^4)^3}{(-3)^{15}} \times \frac{(3^2)^4}{3^4}$

- a.  $-3^{10}$
- b.  $-6$
- c.  $-3$
- d.  $-9^{10}$

(2)

#### QUESTION 3

What property of real number is this?  $a(7 + xy) = 7a + axy$

- a. Commutative property of Addition
- b. Distributive property of multiplication over addition
- c. Additive property inverse
- d. Associative property of addition

(2)

**QUESTION 4**

Simplify:  $\frac{-16a^4b^6}{-8ab^2c}$

a.  $2a^3b^4c$

b.  $3a^5b^4c^{-1}$

c.  $\frac{2a^3b^4}{c}$

d.  $\frac{8a^4b^4}{c^{-1}}$

(2)

**QUESTION 5**

Is the number  $\sqrt{100}$  an irrational number?

a. False

b. True

c. A and B

d. None of the above

(2)

**QUESTION 6**

What is the degree of the polynomial.  $x^2 - 10^5$

a. Degree 5

b. Degree 2

c. Degree 0

d. Degree 7

(2)

**QUESTION 7**

Simplify:  $2\sqrt{150} - 4\sqrt{54} + 6\sqrt{48}$

a.  $-2\sqrt{96} + 6\sqrt{48}$

b.  $4\sqrt{144}$

c.  $24\sqrt{3} - 2\sqrt{6}$

d.  $74\sqrt{2}$

(2)

**QUESTION 8**

Factorize completely:  $4y^2 - 100$

a.  $(2y - 50)(2y + 50)$

b.  $4(y + 5)(y - 5)$

c.  $(2y - 10)(2y - 10)$

d.  $(2y - 10)(2y + 10)$

(2)

**QUESTION 9**

Evaluate the fraction:  $\frac{x^3y - y^3x}{x^2y - xy^2}$

a.  $x - y$

b.  $x + y$

c.  $(x + y)(x - y)$

d.  $x^2 - xy^2$

(2)

**QUESTION 10**

Solve the equation:  $5(x - 4) = 1(x + 1) - 7$

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

b.  $x = \frac{2}{5}$

c.  $x = \frac{3}{7}$

d.  $x = \frac{7}{2}$

(2)

**QUESTION 11**

Evaluate the following Exponent:  $\frac{a^3b^{-1/2}}{ab^{-3/2}}$

a.  $a^2b$

b.  $a^2b^{-2}$

c.  $a^3b^{-2}$

d.  $a^3b$

(2)

**QUESTION 12**

Multiply the radical:  $(2\sqrt{3} - \sqrt{6})(3\sqrt{3} + 3\sqrt{6})$

- a.  $-6\sqrt{18}$
- b.  $9\sqrt{2}$
- c.  $6 + \sqrt{6}$
- d.  $14 - 4\sqrt{6}$

(2)

**QUESTION 13**

Solve the equation:  $\frac{y^2 - 4}{y - 2} = 2y - 1$

- a.  $y = 3$
- b.  $y = -1$
- c.  $y = 2$
- d.  $y = -2$

(2)

**QUESTION 14**

Express the ratio as a simplified fraction:  $x^2y^3 : 3xy^4$

- a.  $\frac{x}{3y}$
- b.  $\frac{3}{xy}$
- c.  $\frac{xy}{3}$
- d.  $\frac{3x}{y}$

(2)

**QUESTION 15**

Find the fourth proportional of numbers:  $m + 2$ ,  $m - 2$ , 3

- a.  $3 - m$
- b.  $\frac{3(m-2)}{m+2}$
- c.  $\frac{m+2}{m-3}$

d.  $3 + m$

(2)

**SUBTOTAL: [30]**

**Section B**

**Calculations**

**70 Marks**

Answer the following questions in your answer book.

**QUESTION 1**

1.1 Divide:  $\frac{2x^4 + 3x^3 - x^2 + 0x - 1}{x - 2}$  (5)

1.2 **Add** the algebraic expressions:

$$(2x^2 + y^2 - x + y) + (3y^2 + x - x^2) + (x - 2y + x^2 - 4y^2)$$

(4)

(4)

1.3 Evaluate the following expression given:

$x = -1, \quad y = 3, \quad z = 2, \quad a = \frac{1}{2}, \quad b = \frac{-2}{3}$

a)  $9ab^2 + 6ab - 4a^2$  (3)

b)  $(x - y)(y - z)(z - x)$  (3)

c)  $\frac{(x-y)^2 + 2z}{ax + by}$  (3)

d)  $\frac{(x-1)(y-1)(z-1)}{(a-1)(b-1)}$  (3)

e)  $\frac{z(x+y)}{8a^2} - \frac{3ab}{y-x+1}$  (3)

**[24]**

**QUESTION 2**

2.1 Multiply the following algebraic expressions:

- a)  $(3t^2s - 2)(4t - 3s)$  (3)
- b)  $(7x^2 - 2xy)^2$  (3)
- c)  $(x^3 + 2 + xy)(x^3 - 2 + xy)$  (4)

2.2 Factorize the following:

- a)  $x^2y - 3x^2 - y + 3$  (3)
- b)  $3x^3 - 3x^2 - 18x$  (3)
- c)  $y^4 + 7y^2 + 12$  (4)

2.3 Evaluate the following expressions:

- a)  $\frac{(x^{-2})^{-3} * (x^{-1/3})^9}{(x^{1/2})^{-3} * (x^{-3/2})^5}$  (3)
- b)  $\frac{(x^{3/4} * x^{1/2})^{1/3}}{(y^{2/3} * y^{4/3})^{1/2}}$  (3)

[26]

### QUESTION 3

3.1 Simplify the following fractions:

- a)  $\left(\frac{1}{x} + 1\right) \div \left(\frac{1}{x} - 1\right)$  (3)
- b)  $\frac{xy^2}{2x-2y} \times \frac{x^2-y^2}{x^3y^2}$  (3)

3.2 Simplify the following by rationalizing the denominator

- a)  $\frac{3}{\sqrt{5} + \sqrt{2}}$  (4)
- b)  $\frac{5}{3 + \sqrt{12}}$  (4)

3.3 Solve the following equations:

- a) This year's sales are R121, 000 which is 10% more than last year's sales. Find last year's sales. (3)

- b) Marcel wanted a CD player for his birthday and it is on sale for 25% off its original price. If the discounted amount is R100. Find the original price of the CD player. (3)

[20]

**SUBTOTAL: [70]**

**TOTAL: [100]**