Section A

Multiple Choice   **2marks 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 1

Simplify: $\dfrac{(-3)(8)(-2)}{(-4)(-6) - (2)(-12)}$

a. $\dfrac{3}{-20}$

b. $\dfrac{1}{12}$

c. 1

d. $\dfrac{-1}{12}$ (2)

QUESTION 2

Evaluate $[12 + (-4)] + (6 - 8)$

a. 6

b. -5

c. 46

d. 8

(2)

QUESTION 3

What property of real number is this? $5(2 + 3) = 5 * 2 + 5 * 3$

a. Commutative property of multiplication

b. Distributive property of multiplication over addition

c. Additive property inverse

d. Associative property of multiplication

(2)

QUESTION 4

Simplify: $(-2ab^3)(4a^2b^5)$

a. $8a^2b^{15}$

b. $-6a^2b^8$

c. $2a^2b^5$

d. $-8a^3b^8$

QUESTION 5

The algebraic expression $\sqrt{x^2 + y^2 + z^2}$ is a polynomial.

a. True

b. False

c. A and B

d. None of the above   (2)

QUESTION 6

Factor: $9x^2 - 1$

a. $(9x - 1)(9x + 1)$

b. $(9 + 1)(x^2 - 1)$

c. $(3x + 1)(3x - 1)$

d. *none of the above*   (2)

QUESTION 7

Multiply: $(2x^5)(3x^6)$

a. $5x^{11}$

b. $6x^{30}$

c. $3x^{-1}$

d. $6x^{11}$ (2)

QUESTION 8

Simplify: $(x^3)^5$

a. x^8

b. x^{15}

c. x^2

d. x^{-2}

(2)

QUESTION 9

Simplify the fraction: $\frac{10xy^2}{3z} \div \frac{5xy}{6z^3}$

a. $\frac{15x^2y^3}{9z^4}$

b. $4yz^2$

c. $\frac{5x^2y^3}{4z^4}$

d. $5x^2y^3$

(2)

QUESTION 10

Multiply: $(2x + 3y)(2x - 3y)$

a. $4x^2 - 9y^2$

b. $4x^2 - 12xy - 9y^2$

c. $4x^2 + 12xy - 9y^2$

d. $(5xy)(-1xy)$

(2)

QUESTION 11

Simplify the radical: $4\sqrt{12} + 2\sqrt{16} - \sqrt{44}$

a. $\underline{8\sqrt{3} + 8 - 2\sqrt{11}}$

b. $6\sqrt{-16}$

c. $48 + 32 - \sqrt{44}$

d. $3 + 8 - 22$

(2)

QUESTION 12

Solve for x: $0.3x - 0.2(3 - 5x) = -0.5(x - 6)$

a. $x = 5$

b. $x = 0.1$

c. $x = 2$

d. $x = 1.3$ (2)

QUESTION 13

Solve for T_2 if $\dfrac{P_1V_1}{T_1} = \dfrac{P_2V_2}{T_2}$

a. $T_2 = P_1V_1 = P_2V_2$

b. $T_2 = \dfrac{P_2V_2T_1}{P_1V_1}$

c. $T_2 = \dfrac{P_1V_1}{P_2V_2T_1}$

d. $T_2 = \dfrac{P_1V_1}{T_1}$ (2)

QUESTION 14

Find the fourth proportional: $25, 5, 20, \_\_$

a. 15

b. 4

c. 30

d. 10 (2)

QUESTION 15

Simplify the fraction: $\left[\dfrac{8}{x^2-1} \right] \div \left[\dfrac{10}{x+1} \right]$

a. $\dfrac{8x(x+1)}{10(x^2-1)}$

b. $\dfrac{80}{(x+1)(x^2-1)}$

c. $\dfrac{8(x+1)}{10(x^2-1)}$

d. $\dfrac{4}{5(x-1)}$ (2)

Section B

Calculations **70 Marks**

Answer the following questions in your answer book.

QUESTION 1

1.1   Simplify the expressions:

1.1.1 $x - 3 - 2\{2 - 3(x - y)\}$ (3)

1.1.2 $2\{4^3 - 6[4 - 2(2 - 4)] - 3\}$ (3)

1.2   Add the algebraic expression: $(2x^2 - 3x - 6) + (-4x^2 + 8x + 6)$

(3)

1.3   Evaluate each of the following algebraic expressions, given that :

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

1.3.1 $4x^3y^2 - 3xz^2$ (2)

1.3.2 $(x - y)(y - z)(z - x)$ (3)

1.3.3 $9ab^2 + 6ab - 4a^2$ (3)

1.3.4 $\dfrac{(x - y)^2 + 2z}{ax + by}$ (3)

[20]

QUESTION 2

2.1 Find each of the following products:

2.1.1 $-7x^2(3x^3 - 4x^2 + 6x - 2)$ (2)

2.1.2 $(5a - 4b)(2a + 3b)$ (4)

2.1.3 $(7x^2 + 2y^2)^2$ (4)

2.1.4 $(3x - 2)(4x^3 + 2x^2 + 7x - 5)$ (4)

2.2   Factor each expression:

2.2.1 $ax - 3a - 2bx + 6b$ (2)

2.2.2 $x^2 + 12x - 45$ (3)

2.2.3 $7x^2 + 21x - 70$ (3)

2.3　Due to an advertising campaign, sales of radio-controlled cars, boats, and planes at Thabisang Engineering coy climbed from R36,600 last month to R113,460 this month. Find the percentage of increase.

(3)

[25]

QUESTION 3

3.1 Simplify the algebraic fractions completely:

3.1.1　$\dfrac{y^2-25}{2y^2-8y-10}$

(3)

3.1.2　$\left(\dfrac{3+x}{3-x}\right) \div \left(\dfrac{x^2-9}{9x^3}\right)$

(3)

3.2 Evaluate the following exponents:

3.2.1　$\dfrac{(x^{3/4} * x^{1/2})^{1/3}}{(y^{2/3} * y^{4/3})^{1/2}}$

(3)

3.2.2　$\dfrac{(x+y)^{\frac{2}{3}} (x+y)^{-\frac{1}{6}}}{[(x+y)^2]^{\frac{1}{4}}}$

(3)

3.3 Rationalize the following radicals:

3.3.1　$\dfrac{1}{5-3\sqrt{2}}$

(4)

3.3.2　$\dfrac{\sqrt{3}+\sqrt{5}}{\sqrt{3}-\sqrt{5}}$

(4)

3.4 The Center City Animal Hospital treated a total of 18, 360 dogs and cats last year. The hospital treated 1376 more dogs than cats. How many dogs were treated last year? How many cats were treated last year?

(5)

[25]

SUBTOTAL: [70]

TOTAL: [100]