Factorization and Algebraic Manipulation - Unit No. 4 Test # 1

Time: 30 Minutes Total Marks: 20

Part A – Multiple Choice Questions (1 mark each)

1. Degree of a cubic polynomial is:

a - 1

b - 2

c - 3

d - 4

2. The identity (a + b)^3 equals:

a - a^3 + b^3

b - a^3 + 3ab + b^3

c - a^3 + 3a^2b + 3ab^2 + b^3

d - a^3 + 3ab^2 + b^3

3. The factorization of 12x + 36 is:

a - 12(x + 3)

b - 12(3x)

c - 12(3x + 1)

d - x(12 + 36x)

4. Square root of (x - 3)^2 is:

a - x - 3

b - x + 3

c - ±(x - 3)

d - ±(x + 3)

5. One factor of x^3 - 27 is:

a - x + 3

b - x - 3

c - x^2 + 3x + 9

d - Both x - 3 and x^2 + 3x + 9

Part B – Short Questions (2 marks each)

1. Define Square Root of an algebraic expression.

2. Factorize: x^3 + 3x^2 + 3x + 1

3. Factorize: 3x^2 + 5x + 2

4. Find square root: x^2 − 8x + 16 (By Factorization)

5. Find HCF: 21x^2y, 35xy^2 (By Factorization Method)

Part C – Long Question (5 marks)

1. An investor’s return R(x) in rupees after investing x thousand rupees is given by the quadratic expression: R(x) = −x^2 + 6x − 8. Factorize the expression and find the investment levels that result in zero return.

Factorization and Algebraic Manipulation - Unit No. 4 Test # 2

Time: 30 Minutes Total Marks: 20

Part A – Multiple Choice Questions (1 mark each)

1. The factorization of 12x + 36 is:

a - 12(x + 3)

b - 12(3x)

c - 12(3x + 1)

d - x(12 + 36x)

2. The identity (a + b)^3 equals:

a - a^3 + b^3

b - a^3 + 3ab + b^3

c - a^3 + 3a^2b + 3ab^2 + b^3

d - a^3 + 3ab^2 + b^3

3. LCM of (a - b)^2 and (a - b)^4 is:

a - (a - b)^2

b - (a - b)^3

c - (a - b)^4

d - (a - b)^6

4. Square root of (x - 3)^2 is:

a - x - 3

b - x + 3

c - ±(x - 3)

d - ±(x + 3)

5. One factor of x^3 - 27 is:

a - x + 3

b - x - 3

c - x^2 + 3x + 9

d - Both x - 3 and x^2 + 3x + 9

Part B – Short Questions (2 marks each)

1. Define Square Root of an algebraic expression.

2. Factorize: 125a^3 - 1

3. Factorize: x^3 - 27

4. Find LCM: x^2 + x, x^3 + x^2 (By Prime Factorization Method)

5. Factorize: x^2 - 6x + 8

Part C – Long Question (5 marks)

1. A company's profit P(x) in rupees from selling x units of a product is modeled by the cubic expression: P(x) = x^3 − 15x^2 + 75x − 125. Find the break-even point(s), where the profit is zero.

Factorization and Algebraic Manipulation - Unit No. 4 Test # 3

Time: 30 Minutes Total Marks: 20

Part A – Multiple Choice Questions (1 mark each)

1. The factorization of 12x + 36 is:

a - 12(x + 3)

b - 12(3x)

c - 12(3x + 1)

d - x(12 + 36x)

2. The identity (a + b)^3 equals:

a - a^3 + b^3

b - a^3 + 3ab + b^3

c - a^3 + 3a^2b + 3ab^2 + b^3

d - a^3 + 3ab^2 + b^3

3. Degree of a cubic polynomial is:

a - 1

b - 2

c - 3

d - 4

4. LCM of (a - b)^2 and (a - b)^4 is:

a - (a - b)^2

b - (a - b)^3

c - (a - b)^4

d - (a - b)^6

5. Product of HCF and LCM of two polynomials equals:

a - sum

b - difference

c - product

d - quotient

Part B – Short Questions (2 marks each)

1. Define HCF (Highest Common Factor) of algebraic expressions.

2. Factorize: 125a^3 - 1

3. Factorize: 3x^2 + 5x + 2

4. Factorize: x^2 + 4x + 3

5. Factorize: x^2 - 6x + 8

Part C – Long Question (5 marks)

1. Factorize: (x + 3)(x + 4)(x + 5)(x + 6) – 360

Factorization and Algebraic Manipulation - Unit No. 4 Test # 4

Time: 30 Minutes Total Marks: 20

Part A – Multiple Choice Questions (1 mark each)

1. HCF of a^3b^3 and ab^2 is:

a - a^3b^3

b - ab^2

c - a^4b^5

d - a^2b

2. The identity (a + b)^3 equals:

a - a^3 + b^3

b - a^3 + 3ab + b^3

c - a^3 + 3a^2b + 3ab^2 + b^3

d - a^3 + 3ab^2 + b^3

3. Product of HCF and LCM of two polynomials equals:

a - sum

b - difference

c - product

d - quotient

4. One factor of x^3 - 27 is:

a - x + 3

b - x - 3

c - x^2 + 3x + 9

d - Both x - 3 and x^2 + 3x + 9

5. The factorization of 12x + 36 is:

a - 12(x + 3)

b - 12(3x)

c - 12(3x + 1)

d - x(12 + 36x)

Part B – Short Questions (2 marks each)

1. Define HCF (Highest Common Factor) of algebraic expressions.

2. Find LCM: x^2 + x, x^3 + x^2 (By Prime Factorization Method)

3. Factorize: x^2 - 6x + 8

4. Find square root: x^2 − 8x + 16 (By Factorization)

5. Factorize: x^2 + 4x + 3

Part C – Long Question (5 marks)

1. Find the square root of 4x^4 − 28x^3 + 37x^2 + 42x + 9 by division method.

Factorization and Algebraic Manipulation - Unit No. 4 Test # 5

Time: 30 Minutes Total Marks: 20

Part A – Multiple Choice Questions (1 mark each)

1. HCF of a^3b^3 and ab^2 is:

a - a^3b^3

b - ab^2

c - a^4b^5

d - a^2b

2. Square root of (x - 3)^2 is:

a - x - 3

b - x + 3

c - ±(x - 3)

d - ±(x + 3)

3. Product of HCF and LCM of two polynomials equals:

a - sum

b - difference

c - product

d - quotient

4. One factor of x^3 - 27 is:

a - x + 3

b - x - 3

c - x^2 + 3x + 9

d - Both x - 3 and x^2 + 3x + 9

5. Degree of a cubic polynomial is:

a - 1

b - 2

c - 3

d - 4

Part B – Short Questions (2 marks each)

1. Define LCM (Least Common Multiple) of algebraic expressions.

2. Factorize: x^3 + 3x^2 + 3x + 1

3. Factorize: x^2 + 4x + 3

4. Factorize: x^3 - 27

5. Factorize: 6x + 12

Part C – Long Question (5 marks)

1. In structural engineering, the deflection Y(x) of a beam is given by: Y(x) = 2x^2 − 8x + 6. Find the points of zero deflection.