1. Find the multiplicative inverse of:
2. Factorize:
3. Simplify: in form
4. Construct a truth table of:
5. Prove that:
6. Simplify:
7. Factorize: 9a2 + 16b2.
8. Write down the power set of .
9. For find the relations in . State the domain and range of .
10. Find and if:

**3. Solve the following questions. (Any eight) (8×2=16)**

1. Find the inverse:
2. If and are square matrices of same order then explain why:

1. Solve for: if and
2. Solve the determinant:
3. Without expansion show that:
4. Find the value of if
5. Without expansion verify that:
6. If and verify that:
7. Show that: has closure property addition and multiplication.
8. Simplify:

**4. Solve the following questions. (Any nine). (9×2=18)**

1. Define proper subset and improper subset.
2. Prove that 1 + ω + ω2 = 0.
3. Resolve into partial fractions:
4. Define finite and infinite group.
5. Show that (x ‒ 2) is a factor of x4 ‒ 13x2 + 36.
6. Define a set.
7. Define symmetric and skew symmetric matrices.
8. Prove that x3 + y3 = (x + y)(x + ωy)(x + ω2y).
9. By synthetic division show that x = 2 is solution of polynomial x3‒ 7x + 6 = 0.
10. What are the reciprocal equations?
11. What is the difference between {a, b} and {{a, b}}?

**(Section – II)**

**Note:** **Attempt any THREE of the following questions.** **(10×3=30)**

**5. a)** Resolve into partial fraction: **(5)**

**b)** Resolve into partial fractions: **(5)**

**6. a)** Solve the system of equations **(5)**

**b)** Solve the system of equations **(5)**

**7. a)** Use Cramer’s rule to solve the system:

2x + 2y + z = 3; 3x ‒ 2y ‒ 2z = 1; 5x + y ‒ 3z = 3 **(5)**

**b)** Solve the equation 4x ‒ 3.2x + 3 +128 = 0 **(5)**

**8. a)** Solve that: **(5)**

**b)** Solve the matrix equation for : **(5)**