1. If A =  and B =  where i2 =-1, then show that (A+B)2 = A2 + B2
2. If A = , show that A3 –A2 - 18A -30I = 0
3. If A = , show that A3 – 4A2 – 3A +11I = 0
4. If A = , B = , C = and D =  then calculate the following products or give reasons why they are not defined?
5. BA ii) ATB iii) AB
6. ATD v) DA vi) AD
7. C2  viii) CTC ix) CCT
8. Prove that the following:
9. The sum of two symmetric matrix is symmetric.
10. If A is square matrix then A + AT is symmetric and A - AT is skew- symmetric.
11. Find the inverse of following matrices:
    1. 
    2. 
12. From the properties, Find the determinant of following matrices:
    1. 
    2. 
    3. 
13. Solve the following equations using Gauss elimination method:
    1. 3x+20 = 4y-10

4(x-1) = 3(y-3)

* 1. x-2y-z = 1

x-y+2z = 9

2x-3y-z = 4

1. Define contradiction and tautology. Prove the following
2. [(A→B) ∧ A]→B is a tautology.
3. II. (A∨B) ∧ [(¬A) ∧ (¬B)] is a contradiction.
4. III. (A∨B) ∧ (¬A) is a contingency.
5. Define fallacy. Explain the forms of fallacy.
6. Explain the connectives of propositional logic with truth tables.
7. Explain predicates and Quantifiers with one examples of each.
8. Prove using mathematical induction.
   1. 1+4+7+10+ …… (3n-2) = n/2 (3n-1)
   2. n3 + 2 n is divisible by 3 for any positive integer.
   3. 2+4+6+……2n = n(n+1)
9. Prove using direct proof.
   1. If n is an odd integer n2 is also an odd integer.
   2. If n is an even integer, then 3n+5 is an odd integer.
   3. If n is an odd integer, then n2+2 is an odd integer.
10. √2 is an irrational number. Prove by the method of contradiction.