***Note***: Answer all the sections.

**Section-A**

Attempt a**ll** the parts**. 5×2=10**

1. Find approximate value of .
2. If the base radius and height of a cone are measured as 4 and 8 inches with a possible error of 0.04 and 0.08 inches respectively, calculate the percentage (%) error in calculating volume of the cone.
3. Investigate for consistency of the following equations:

,  and .

1. If rank of the matrix  is 2 then find value of b.
2. If the vectors ,  and  is linearly dependent, then find the value of *a*.

**Section-B**

Attempt **all** the parts. **5×5=25**

1. In a plane triangle ABC, find the maximum value of .
2. Expand  in powers of (x-1) and (y-1) up to the third degree terms and hence evaluate 
3. Find the characteristic equation of the matrix  and hence, compute . Also find the matrix represented by .
4. If , check whether they are dependent or not. Find the relation between them if possible*.*
5. Determine the values of λ and µ such that the system,  and  has (i) no solution (ii) a unique solution (iii) infinite number of solutions. Find all possible solutions.

**Section-C**

Attempt **all** the parts**. 2×7.5=15**

1. Find the dimensions of a rectangular box of maximum capacity whose surface area is given when

box is open at the top (ii) box is closed.

1. Diagonalise the matrix .