

## Tribhuvan University

## Faculty of Humanities & Social Sciences OFFICE OF THE DEAN

2024

Bachelor in Computer Applications

Course Title: Mathematics

Code No: CAMT 104

Semester: I

Full Marks: 60 Pass Marks: 24

Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

## Group B

Attempt any SIX questions.

 $[6 \times 5 = 30]$ 

Solve the inequality  $3 + 2x - x^2 \ge 0$ 

3. Find the domain and range of the function  $f(x) = \sqrt{6 - x - x^2}$ .

4. If a, b, c, and d are in G.P. prove that  $a^2 - b^2$ ,  $b^2 - c^2$ ,  $c^2 - d^2$  are also in G.P.

5. Prove that  $\begin{bmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1+z \end{bmatrix} = xyz\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z} + 1\right)$ 

Find the equation of the ellipse whose latus rectum is 5 and the eccentricity is  $\frac{1}{\sqrt{2}}$ .

If  $\vec{a}$ ,  $\vec{b} = \sqrt{3}$  and  $\vec{a} \times \vec{b} = (1, 2, 2)$  find the angle between  $\vec{a}$  and  $\vec{b}$ .

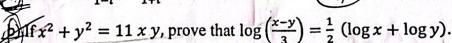
8. How many numbers of three different digits less than 500 can be formed from the integers 1, 2, 3, 4, 5, and 6?

## Group C

Attempt any TWO questions.

 $[2 \times 10 = 20]$ 

9. The rove that  $\frac{3+4i}{1-i} + \frac{3-4i}{1+i}$  is a real number.



10. a) Find the Maclourin series of the function  $f(x) = \cos x$ .

b) Take any matrix of order 3 × 3 and express it as a sum of symmetric and skew-symmetric matrix.

11. a) Find the equation of a hyperbola in standard form having focus (-2,0) and Diretrix  $x = -\frac{1}{2}$ .

In an examination paper on mathematics, 20 questions are set. In how many different ways you can choose 18 questions to answer?

