TRIBHUVAN UNIVERSITY

2024

Bachelors in Computer Application **Full Marks: 60**

Course Title: Math I **Pass Marks: 24**

Code No: CAMT 104

Semester: I

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

Group B

Attempt any SIX questions. (6*5=30)

1. Solve the inequality 3+2x−x2≥0.
2. Find the domain and range of the function f(x)=√6 − x − x2.
3. If a, b, c, and d are in G.P., prove that a2−b2, b2−c2,c2−d2 are also in G.P.
4. Prove that :

$$\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix} = xyz\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)$$

5. Find the equation of the ellipse whose latus rectum is 5 and the eccentricity is 12.
6. If $\vec{a} = \sqrt{3}\hat{i} + \hat{j}$ and $\vec{a} \times \vec{b} = (1, 2, 2)$, find the angle between $\vec{a}$ and $\vec{b}$.
7. 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*10=20)

8. a. Prove that

$$\frac{3+4i}{1-i} + \frac{3-4i}{1+i}$$

is a real number.

b. If x2+y2=11xy, prove that log(x−y3)2=12(log x+ log y)

9. a. Find the Maclaurin 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.

10. a. Find the equation of a hyperbola in standard form having focus (-2, 0) and Directrix $x=-1/2$.

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