



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2025

Bachelor in Computer Applications
Course Title: Mathematics I
Code No: CAMT104
Semester: I

Full Marks: 60
Pass Marks: 24
Time: 3 hours
Batch: 2024

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

Group B

Attempt any SIX questions.

[6×5 = 30]

2. In an examination, 27% of the students failed in Mathematics and 31% failed in statistics. If 6% of the students failed in both subjects, find the percentage of the students
 - a) failed in examination.
 - b) passed in both subjects.
3. a) If $A = [-3, 1)$ and $B = [-2, 4]$. Find $A - B$ with graphical representation in a real line. [2.5]
b) Rewrite $-3 < x < 4$ by using the modulus sign.
4. Let $f: \mathbb{R} \rightarrow \mathbb{R}$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = 2x + 1$ and $g(x) = 3x - 1$,
find i) $\text{gof}(x)$ ii) $\text{fog}(x)$ [2 + 3]
5. Sum to n terms of the series $1.3 + 3.5 + 5.7 + \dots$
6. Prove that:
$$\begin{vmatrix} a+x & b & c \\ a & b+y & c \\ a & b & c+z \end{vmatrix} = xyz \left(1 + \frac{a}{x} + \frac{b}{y} + \frac{c}{z} \right).$$
7. Find the centre, vertices, eccentricity, foci and length of major axis of the ellipse: $25x^2 + 4y^2 = 100$.
8. The letters of the word 'STRANGE' are to be shuffled to form different words such that
 - a) the vowels always come together.
 - b) the vowels may occupy only the odd positions

Group C

Attempt any TWO questions.

[2×10 = 20]

9. If arithmetic mean, geometric mean and harmonic mean between two unequal positive numbers are A , G , H respectively, then prove that:
 - a) $(G.M.)^2 = A.M. \times H.M.$
 - b) $A.M. > G.M. > H.M.$
10. a) Define scalar product of two vectors in space. By vector method, in triangle ΔABC prove that
$$c = a \cos B + b \cos A.$$

b) Find the area of the parallelogram determined by the vectors $\vec{i} + 2\vec{j} + 3\vec{k}$ and $-3\vec{i} - 2\vec{j} + \vec{k}$.
11. Find the equation of a circle passing through the points $(1, 2)$, $(3, 1)$ and $(-3, -1)$.