



**Tribhuvan University**  
**Faculty of Humanities & Social Sciences**  
**OFFICE OF THE DEAN 2018**

**Bachelor in Computer Applications**

**Course Title: Mathematics**

**Code No: CAMT 104**

**Semester: I<sup>st</sup>**

**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.**

**[6×5 = 30]**

11. 32 students play basketball and 25 students play volleyball. It is found that 20 students play both the games. Find the number of students playing at least one game. Also, find total number of students if 13 students play none of these games.
12. Let  $f : \mathbb{N} \rightarrow \mathbb{N}$  be defined by  $f(x) = 2x$  for all  $x \in \mathbb{N}$  where  $\mathbb{N}$  is the set of natural numbers. Show that  $f$  is one-one but not onto function.
13. If the three consecutive term of a geometric series be increased by their middle term, then prove that the resulting terms will be in harmonic progression (H.S.).

14. Find the adjoint of the matrix: 
$$\begin{pmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{pmatrix}$$

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

16. Find the equation of parabola with focus  $(-1, 2)$  and directrix  $x = -5$ .

17. Transform  $u = \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$ ,  $v = \begin{bmatrix} -2 \\ 3 \\ 1 \end{bmatrix}$  by  $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$  and check whether this transformation is linear?

**Group C**

**Attempt any TWO questions.**

**[2×10 = 20]**

18. Define permutation and combination try to establish relationship between them with the help of formulae. In how many ways can the letters of the word "LOGIC" be arranged so that
- i) Vowels may occupy odd position?
  - ii) No vowels are together?

19. Define scalar and vector product in three dimensional space with their geometrical interpretation and prove the formula  $\sin(A + B) = \sin A \cos B + \cos A \sin B$  by using vector method.
20. Define the logarithmic function, state its properties and if  $f(x) = \log \frac{1+x}{1-x} (-1 < x < 1)$

show that  $f(a) + f(b) = f\left(\frac{a+b}{1+ab}\right)$   $\left(\begin{matrix} |a| < 1, |b| < 1 \end{matrix}\right)$

# BCA

## NOTES

# N e p a l

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