CAMT 104-2019

Tribhuvan University
Faculty of Humanities and Social Sciences
Office of the Dean
2019

Bachelor in Computer Application **Full Marks: 60**
Course Title: Mathematics I **Pass Marks: 24**
Code no: CAMT 104 **Time: 3 hours**
Semester: I

Candidates are required to give their answers in their own words as for as practicable. The figures in the margin indicate full marks.

Group B

Attempt any SIX questions. [6x5=30]

1. In a class A 100 students, 40 students failed in Mathematics, 70 failed in English and 20 failed in both subjects. Find
   a. How many students passed in both exams?
   b. How many students passed in mathematics only?
   c. How many students failed in mathematics only?

2. Find the domain and range of the function f(x) = (2x + 1) /(3-x)

3. Find the Maclaurin series of the function f(x) = sinx

4. Prove that:
$$\begin{bmatrix} 1 & x & x^2 \\ 1 & y & y^2 \\ 1 & z & z^2 \end{bmatrix} = (x-y)(y-z)(z-x)$$

5. Find a unit vector perpendicular to the photo containing points P(1, -I, 0), Q(2, 1, -1) and R(-1, 1, 2).

6. In how many ways can be letter of words "Sunday" be arranged? How many of these arrangement begin with S? How many begin with S and don't end with y?

7. If $x + iy = \sqrt{\frac{1+y}{1-y}}$ show that $x^2 + y^2 = 1$.

Group C

Attempt any TWO question. [2x10=20]

8. a) Define conic section. Find the coordinates of vertices, eccentricity and foci of the ellipse $9x^2 + 4y^2 - 18x - 16y - 11 = 0$ 1+5

   b) If T: $R^2 \rightarrow R^3$ defined by T $(x_{1,} x_{2)} = (x_1 + x_{2,} x_{2,} x_{1)}$ be the linear transformation then matrix associated with linear map T. 4

9. Define irrational number. Prove that $\sqrt{2}$ is irrational number. If function *f*: R→R defined by f(x) = 2x+1 and *g:* R→R defined by $g(x) = x^2 - 2$. Find the formula for composite function $f \bullet g$ and $g \bullet f$ and also verify that $f \bullet g \neq g \bullet f$ 1+4

10. a) If arithmetic mean, geometric mean and harmonic mean between two unequal positive numbers are A, G, H respectively then prove that A > G > H. 4

    b) What is the relation between permutation and combination of n objects taken r at a time? A committee of 5 is to be constituted from 6 boys and 5 girls. In how many ways can this be done so as to include at least a boy and a girl. 1+5