

**BASIC MATHEMATICS (BCA 104)**

**Duration: 2 hours**

**Marks: 50**

**Instruction:** 1) All questions are compulsory  
2) Figures to the right indicate full marks  
3) Start each new question on fresh page  
4) Logarithmic tables will be provided if required.

Q1.A) Answer the following:

(5X1 = 5 Marks)

- Evaluate  $(\tan 65^\circ / \cot 25^\circ) =$
- Evaluate  $\frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta} =$
- Write transpose of a matrix  $A = \begin{bmatrix} 3 & 4 & 5 \\ 8 & 0 & 1 \\ 6 & 5 & 0 \end{bmatrix}$
- What is the value of  $i^3$  and  $i^4$
- Find area of rectangle with  $l = 7$  cm and  $b = 14$  cm.

Q1.B) Answer the following:

(5X1 = 5 Marks)

- Find the degree for the radian  $5\pi/3$
- Find the determinant of  $A = \begin{vmatrix} 1 & 1 & 8 \\ 3 & 3 & 7 \\ 5 & 5 & 6 \end{vmatrix}$
- Find 6<sup>th</sup> term of A.P. series with 1<sup>st</sup> term = 4 and common difference = 2
- Using log, find  $x$  if  $2^x = 4$
- Divide  $32x^2y^5$  and  $4xy$

Q2.) Answer any 2:

(5X2=10 Marks)

- If  $A = \begin{bmatrix} 2 & 3 \\ -1 & 0 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 1 & 5 \\ 2 & 3 & 4 \end{bmatrix}$  and  $C = \begin{bmatrix} 1 & 3 & 4 \\ -2 & 1 & 1 \end{bmatrix}$ , find  $A(B + C)$ .
- Use matrix method to solve the system of equation  $4x - 3y = 11$  and  $3x + 7y = -1$
- Find range and domain for the function  $y = \sqrt{\frac{1}{x-3}}$

Q3.) Answer any 2:

(5X2=10 Marks)

- Find  $\lim_{x \rightarrow 0} \frac{4^x - 3^x}{x}$
- If  $f(x) = ax^2 + bx + 2$  and  $f(1) = 3$  and  $f(4) = 42$ , find  $a$ ,  $b$  and  $f(3)$ .
- Differentiate  $y$  w.r.t  $x$  such that  $y = \frac{2\tan x - 5x}{3\sin x + \log x}$



Q4.) Answer **any 2**:

(5X2=10 Marks)

- a) Integrate  $y$  w.r.t  $x$  where  $y = x^2 \cos x$ .
- b) Integrate  $y$  w.r.t  $x$  where  $y = x^3 \log x$
- c) Find the equation of line passing through the point  $(7, -3)$  and parallel to the line passing which is passing through points  $(-1, 2)$  and  $(5, 11)$

Q5.) Answer **any 2**:

(5X2=10 Marks)

- a) A closed cylindrical tank of radius 7 m and height 3 m is made of a sheet of metal. How much sheet of metal is required. Also, find its volume.
- b) Find the modulus of  $z$ , where  $z = \frac{a+ib}{a-ib}$
- c) Using De Moivre's theorem, find  $(1-i)^8$