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**GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE AND
ECONOMICS, PONDA-GOA**
**B.C.A (SEMESTER-I) SUPPLEMENTARY EXAMINATION (Old Course),
JANUARY 2021**
BCA 104 BASIC MATHEMATICS

Duration: 2 hours   Marks: 30

Q 1) Answer <u>ANY 5</u> of the following questions.   (5×2=10 Marks)

   (i)   The two numbers are in ratio 3:4, if the sum of numbers is 63. find the numbers.

   (ii)   Find the value of x if $3^{3-x} = 27^{x-1}$.

   (iii)   A solid sphere of metal with diameter 20cm is melted and poured into a cylindrical vessel with diameter 30cm. To what height will the metal size in the vessel.

   (iv)   Find the reciprocal of $Z = -7 + 11i$.

   (v)   Solve the following system of equations by using Cramer's Rule.
$5x + 2y - 7 = 0, 6x - 5y - 38 = 0$

   (vi)   Find the three numbers in A.P. whose sum is 33 and product is 1320.

   (vii)   Using trigonometry, prove the identity $\tan^2 \theta = \frac{1-\cos^2 \theta}{\cos^2 \theta}$.

   (viii)   Find unit vector perpendicular to $2i - j + 2k$ and $10i - 2j + 7$.

Q 2) Answer <u>ANY 4</u> of the following questions.   (4×5=20 Marks)

   (i)   Discuss the continuity of the following functions at x=1
$$f(x) = \begin{cases} 2x + 3, & 0 \le x < 1 \\ 3x + 2, & 1 \le x < 2 \end{cases}$$

   (ii)   Find 'a' if the triangle formed by A (2, a), B (3, 4) & C (4, 1) is right angled at A.

   (iii)   If the sum of the first n terms of an arithmetic progression with a = 1and d = 5 is 286, find n.

(iv) Find the inverse of the matrix $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$.

(v) Find the fifth roots of complex number $Z = 2 + 2\sqrt{3}i$.

(vi) Mother divided the money among Joy, Maria and Julie in the ratio 2:3:5 respectively. If Maria got `150, then find the total amount of money and the money received by Joy and Julie.