

GVM's GGPR College of Commerce & Economics,
Farmagudi- Ponda, Goa.

B.C.A. (Semester II) Intra Semester Assessment (ISA) I- Test, January 2020

APPLIED MATHEMATICS

Duration: 45 minutes

Marks: 20

Answer **ANY 4** of the following:

(4×5=20)

Q1.] If $X = \{1, 2, 3, \dots, 15\}$ is the universal set, $A = \{1, 3, 5, 8, 9, 10, 12, 15\}$

$B = \{2, 3, 4, 6, 8, 9, 10, 11, 13\}$ $C = \{1, 2, 5, 8, 9, 14\}$ Verify De-Morgan's law & Distributive laws.

Q2.] If X is the universal set and A & B are subset of X such that $n(X) = 99$, $n(A^c) = 80$, $n(B^c) = 85$ and $n[(A \cap B)^c] = 94$. Find $n(A \cup B)$.

Q3.] If $f(x) = x^2 + 3x - 5$, $0 \leq x \leq 6$ find $f(0)$, $f(2)$, $f(4)$, $f(7)$, whenever they exist also find x if $f(x) = 35$.

Q4.] Find $f\{g(x)\}$ & $g\{f(x)\}$ if

a) $f(x) = x^2$ $g(x) = 5x - 6$

b) $f(x) = x^2 + 4$ $g(x) = \frac{1}{x}$

Q5.] Define an Equivalence Relation. Let $A = \{x \mid x < 4, x \in \mathbb{N}\}$. A relation R on the set A is given by $R = \{(1, 1), (1, 2), (2, 1), (2, 3), (3, 2)\}$ prove that R is symmetric relation but it is neither reflexive nor transitive.

Q6.] Prove that the relation R on the set of integer \mathbb{Z} defined as

$R = \{(x, y) \mid x - y \text{ is divisible by } 3, x \in \mathbb{Z}, y \in \mathbb{Z}\}$ is an equivalence relation.

