THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME: Level 05
DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE
NO BOOK TEST – 01 (NBT-01) – 2016/2017
CPU3140 – Mathematics for Computing
Duration: **One hour only (1 Hour)**

Date: 22nd April, 2017 **Time: 4.00 p.m. - 5.00 p.m.**

Answer **All** Questions.

01. (i) Give the definitions of the following terms regarding sets.
   (a) Union
   (b) Intersection
   (c) Difference

(ii) Give the symbols for the sets given below.
   (a) Set of real numbers.
   (b) Set of rational numbers.
   (c) Set of natural numbers.

(iii) If $f, g = \mathbb{R} \to \mathbb{R}$ where $f(x) = ax+b$, $g(x) = 1-x+x^2$ and $gof(x)=9x^2-9x+3$. Find the values of a and b.

(iv) Consider a propositional language where
   p means " Kamala is Happy"
   q means "Kamala paints a picture"
   r means "Sunil is happy"

   Using logical connectives formalize the following sentences.

   (a) " If Kamala is happy and paints a picture then Sunil isn't happy "
   (b) " If Kamala is happy then she paints a picture "
   (c) " Sunil is not happy "

(v) Write the following two statements in Predicate Logic.
   (a) Every student smiles.
   (b) Every student walks or talks.

02. Using truth tables verify whether
$q \vee (p \wedge \neg q) \vee (\neg p \wedge \neg q)$ is a contradiction or a tautology. Justify your answer.