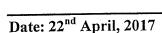
## THE OPEN UNIVERSITY OF SRI LANKA B.Sc. DEGREE PROGRAMME: Level 05 DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

NO BOOK TEST - 01 (NBT-01) - 2016/2017

**CPU3140 – Mathematics for Computing** 

Duration: One hour only (1 Hour)





Time: 4.00 p.m. - 5.00 p.m.

## Answer All Questions.

- (i) Give the definitions of the following terms regarding sets. 01.
  - (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  $q \lor (p \land \neg q) \lor (\neg p \land \neg q)$  is a contradiction or a tautology. Justify your answer.