The Open University of Sri Lanka

B.Sc/B.Ed Degree Programme- Level 05

Department of Mathematics & Computer Science

Pure Mathematics /Computer Science

PMU3294/CSU3276 /PME5294-Discrete Mathematics

No Book Test (NBT)-2012/2013

Duration- One and Half hours

Date:21.03.2013	**Time: 4.00pm-5.30pm**

Answer All Questions

01. Let G be a graph with set of four vertices $\{v_1, v_2, v_3, v_4\}$, whose adjacency matrix A is given by

$$A = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$$

(i) Without drawing the diagram of G, determine whether G is connected.
(ii) Find the number of paths of length three joining v_2 & v_4 and name all those paths.
(iii) Write down all the components of G.

02.(i) Suppose that the universe of discourse is the set of all real numbers. Let P (x) be the statement "x>7 ⇨x is a good number". It is given that ∀xP(x). What can be said about the truth values of each of the following statements? Justify your answer.

(a) 8 is a good number.
(b) 1 is not a good number.
(c) 7is a good number.

(ii) Let A={1,2} and B={3,5}. Determine which of the following propositions are true and which are false.

Justify your answer.

(a) $\forall x \in A, \exists y \in B, x^2 + 2(y+1)x = y^2$

(b) $\forall x \in A, \forall y \in B, x^2 + 2(y+1)x = y^2$

03. A difference equation is given by

$f(n+2)+f(n+1)-2f(n)=0$

(i) Determine the order of the difference equation.

(ii) Show that $f(n)=(-2)^n$ and $f(n)=1$ are solutions of the given difference equation.

(iii) Hence, find the general solution of the given difference equation.