YENISI - I : WINTER - 2016

Subject : Mathematical Foundations

Day : Thursday
Date : 15/12/2016

S.D.E. 33518

Time : 10.00 A.M. TO 1.00 P.M.
Max Marks : 80 Total Pages : 2

N.B.:

1) Attempt **ANY FIVE** questions from Section – I and attempt **ANY TWO** questions from Section – II.
2) Answers to both the sections should be written in the **SAME** answer book.
3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 **a)** Show that $(p \wedge q) \rightarrow (p \vee q)$ is a tautology. **[05]**

b) Prove that $\sim (p \rightarrow q) \equiv p \wedge \sim q$. **[05]**

Q.2 **a)** Let A, B and C be sets. Show that $(A \cup B) \subseteq (A \cup B \cup C)$. **[05]**

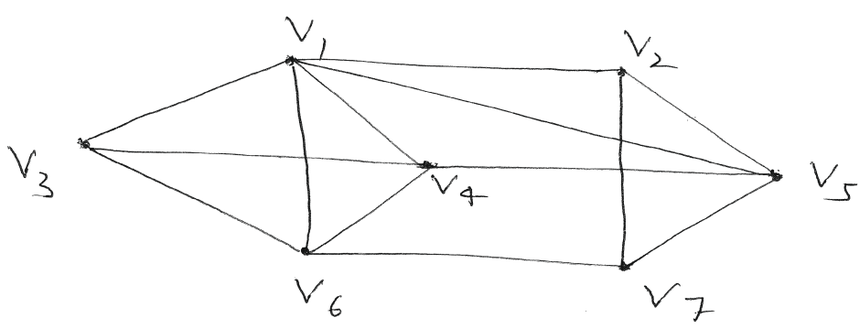
b) Show that $1^2 + 3^2 + 5^2 + \ldots\ldots + (2n-1)^2 = \frac{n(2n-1)(2n+1)}{3}$. **[05]**

Q.3 **a)** If $f : R \rightarrow R$, defined by $f(x) = x^2, \forall x \in R$ and $g : R \rightarrow R$, defined by $g(x) = \sin x, \forall x \in R$ then find *gof* and *fog*. **[05]**

b) Represent the following relations on {1, 2, 3} with a matrix. **[05]**
{(1, 1) (1, 2), (1, 3), (2, 2), (2, 3), (3, 3)}.

Q.4 Write Tree Traversal algorithm. **[10]**

Q.5 Find $\chi(G)$ for the graph as shown in figure using Welch-Powell algorithm. **[10]**



Q.6 Symbolize the following: **[10]**

a) All birds can fly.
b) All babies are innocent.
c) There is an integer such that it is odd and prime.
d) Not all birds can fly.

P.T.O.