Code No. 6026 / S

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I- Semester (Suppl.) Examination, July 2014

Subject : Discrete Structure

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 State Demorgan's law.
2 Write the logical equivalence to $pV(7P\Lambda q)\rightarrow(p\Lambda q)$
3 List the properties of Pigeon hole principle
4 Given set p ={1, 2, 3, …….7}. How many symmetric relations are there on p.
5 Define surjective function. Write a surjective relation in for given set A={1,2,3,4,5}
6 Define semigroup and monoid.
7 What is non homogeneous recurrence relation? Give one example.
8 Write the properties of algebraic system.
9 Solve the Recurrence Relation $a_n - 13a_{n-1} + 42\, a_{n-2} = 2^n$
10 Find chromatic Number of a Bipartiate graph.

PART – B (50 Marks)

11 (a) Define Tautology. Verify $[7r \rightarrow 7(pvq) \rightleftarrows [(pvq)\rightarrow r$ is Tautology or not.

(b) Show that $p \oplus q$ is equivalent to $(p \Lambda 7q)\ v(7p \Lambda q)$

12 (a) Prove that $A\cup(B\cup C) = (A\cup B) \cup(A\cup C)$

(b) The function f : R → R defined as $f(x) = \begin{cases} 3x-5; & x > 0 \\ -3x+1; & x \le 0 \end{cases}$ Then determine

(i) f(-1), f(2/3), and f(-2/3) (ii) $f^{-1}(0)$, $f^{-1}(-6)$, $f^{-1}(1)$

13 (a) List and explain the properties of Binary relations with example.

(b) State and explain the principle of inclusion and exclusion.

14 (a) Solve the recurrence relation

$a_n - 9a_{n-1} + 26a_{n-2} - 24a_{n-3} = 0$ for $n \ge 3$ where $a_o=0$; $a_1=1$; $a_2=10$

(b) Solve the RR $a_r = 3a_{r-1} + 2$; $r \ge 1$, $a_o=1$

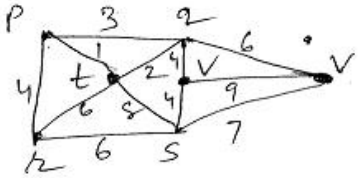
15 (a) Find the coefficient of x^{15} in $\dfrac{(1-x)^4}{(1+x^4)}$

(b) Write short note on Group code and its applications.

16 (a) Prove that <Q+, * > is an algebraic system and * is a binary operator on Q+ is defined by $a * b = \dfrac{a.b}{5}$ is a group.

(b) Define Hamitanian graph write the basic rules for constructing this graph.

17 (a) Define minimal cost spanning Tree. Use Kruskal's algorithm to determine the minimal cost spanning Tree for the following graph.



(b) Define chromatic number. Find the chromatic number for the graph above Question (i.e.17(a)).

*****