

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013****Subject code: 712607****Date: 06-01-2014****Subject Name: Foundation of VLSI CAD (I)****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Let $V_1=(1,2,1)$, $V_2=(2,9,0)$, $V_3=(3,3,4)$. Show that the set $S=\{V_1, V_2, V_3, V_4\}$ is a basis for R^3 **07**

(b) Let $A = \begin{bmatrix} 1 & 2 & -1 & 2 \\ 3 & 5 & 0 & 4 \\ 1 & 1 & 2 & 0 \end{bmatrix}$ **07**

Find bases for the column space of A and null space of A^T .

Q.2 (a) Define orthogonal complement. Write down the properties of orthogonal complement **07**

(b) Check whether the vectors $(1,-1,1)$, $(2,1,1)$, $(3,0,2)$ are linearly dependent or linearly independent. If they are linearly dependent then find the relation between them. **07**

OR

(b) Is $W = (-12, 20)$ a linear combination of $V_1 = (-1, 2)$ and $V_2 = (4, -6)$? **07**

Q.3 (a) Explain any two application of graph theory. **07**

(b) Explain Dijkstra's algorithm. **07**

OR

Q.3 (a) Write a short note on four colour theorem. **07**

(b) Explain stack, queue and linked list with the help of example. **07**

Q.4 (a) Explain BFS algorithm with the help of example. **07**

(b) Explain isomorphism of graphs with the help of example. **07**

OR

Q.4 (a) Explain connected and disconnected graph with the help of example. **07**

(b) Explain Directed Graph and Adirected Graph with the help of example. **07**

Q.5 (a) Explain DFS algorithm with the help of example. **07**

(b) What is meant by Order and Size of Graph? Explain Regular Graph. **07**

OR

Q.5 (a) Write a short note on P and NP problems. **07**

(b) Explain Euler's theorem with the help of example. **07**
