

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M.TECH DEGREE EXAMINATION**

**Electronics & Communication Engineering
(VLSI and Embedded Systems)
04EC6511—VLSI Design Automation**

Max. Marks : 60

Duration: 3 Hours

PART A

Answer All Questions

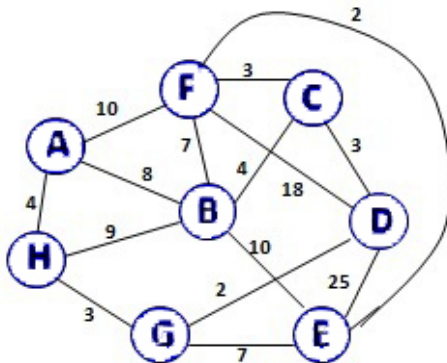
Each question carries 3 marks

1. Define a 'minimum spanning tree'
2. List out the firing rules for a conditional node with proper diagrams
3. Briefly explain layout compaction
4. Differentiate standard cell placement and building block placement.
5. List out the three ways in which a Rectilinear Steiner tree can be realized in standard cell layout
6. Define total channel density
7. List out three parameters that should be considered during local routing
8. Give the significance of 'doglegs' in channel routing

PART B

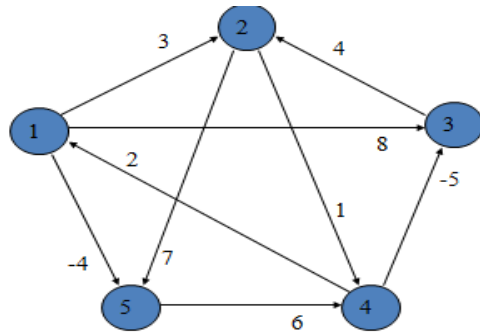
Each question carries 6 marks

9. Calculate the cost of minimum spanning tree using Prim's algorithm

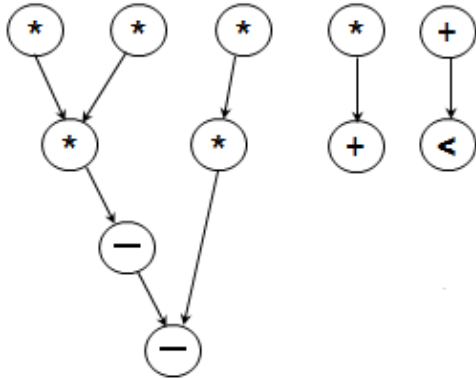


OR

10. Calculate shortest path between all pair of vertices using matrix multiplication modeling



11. Perform force directed scheduling from the data flow graph given below

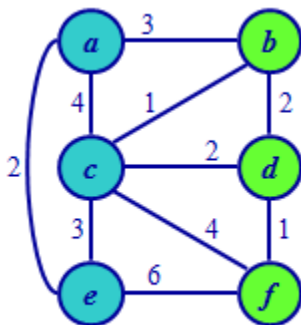


OR

12. Perform resource based scheduling for the data flow graph given in Q.No. 11. Allocated resources are as follows :

Resource	Allocation
*	2
+	1
-	1
<	1

13. Perform K-L Partitioning (pass-1) for the graph given above



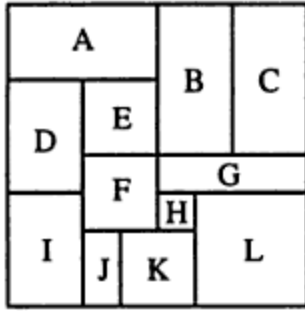
OR

14. Explain (i) Fiduccia-Mattheyses algorithm (ii) Goldberg and Burstein algorithm

15. Interpret any two techniques to perform constructive algorithms in placement

OR

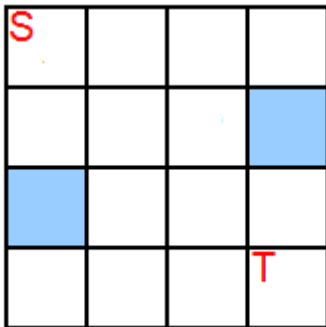
16. Sketch floor plan tree, vertical and horizontal polar graph of the floor plan given below with suitable explanations



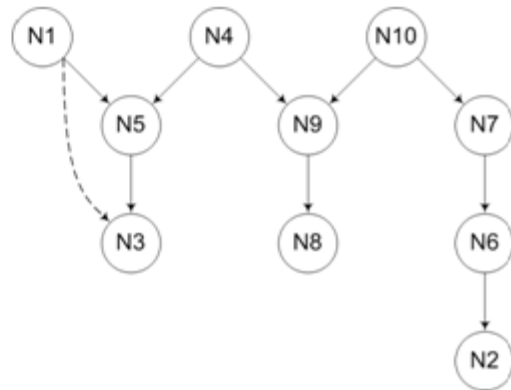
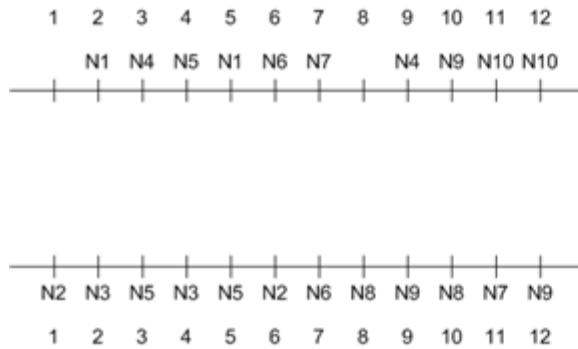
17. Explain steiner tree based global routing algorithm

OR

18. Find shortest route from S to T using Lee's maze routing algorithm. Shaded region represents obstacle



19. Perform left edge channel routing algorithm from the vertical constrained graph given below



OR

20. Illustrate two methods for minimization of via