

CS577: C-Based VLSI Design

Mid Sem - Part 2

Questions: 15, Time: 20 mins, Total Marks: 30

Points: 30/30

✓ **Correct** 2/2 Points

1

How many edges are there in the compatibility graph corresponding to the below schedule?
(Write the Integer value only)

t1	$x = a + b$	$y = c + d$	1	2
t2	$s = x + y$	$t = x - y$	3	4
t3	$z = a + t$	$u = v + w$	5	6

12

✓ **Correct** 2/2 Points

2

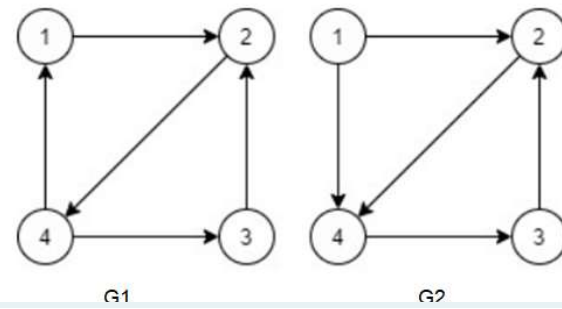
(Figure 4) What is start time of operation 9 considering the resource constraints? (Write the integer value only)

5

✓ Correct 2/2 Points

3

Which one of the following options is correct for the above graphs?



- ☐ c. G2 is a comparability graph but G1 is not
- ☒ d. Neither of them is a comparability graph
- ☐ a. Both are comparability graphs
- ☐ b. G1 is a comparability graph but G2 is not

✓ Correct 2/2 Points

4

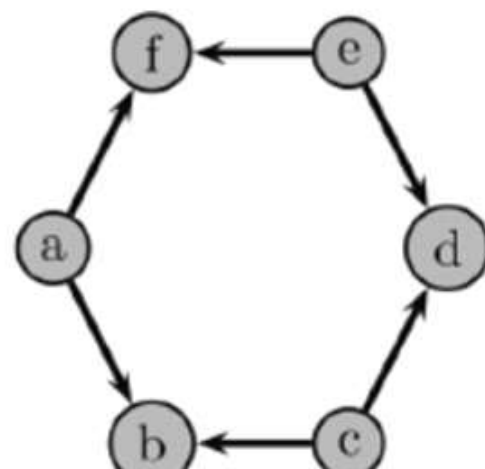
What is the complexity of the left edge algorithm if 'n' is the number of nodes in the interval graph?

- ☐ a. $O(n)$
- ☒ c. $O(n \log n)$
- ☐ b. $O(\log n)$
- ☐ d. $O(n^2 \log n)$

✓ Correct 2/2 Points

5

The given graph is



- ☒ (a) comparability graph
- ☐ (c) Chordal graph
- ☐ (b) an interval graph
- ☐ (d) None of the above

✓ Correct 2/2 Points

6

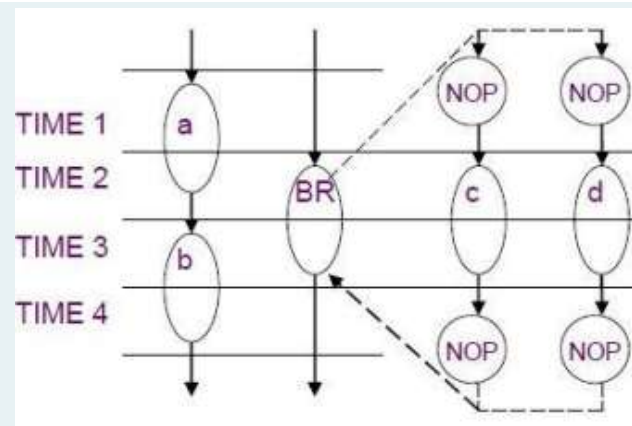
(Figure 4) The latency of this MLRC List schedule is (Write the Integer value only)

7

✓ Correct 2/2 Points

7

Which one of the following is **FALSE** for the scheduling in the given Figure?



- ☒ c) The conflict graph of the scheduling has an edge from node c and d
- ☐ b) The conflict graph of the scheduling has an edge from node a and d
- ☐ a) The conflict graph of the scheduling has an edge from node a and c
- ☐ d) The conflict graph of the scheduling has an edge from node b and c

✓ Correct 2/2 Points

8

(Figure 4) At max how many multipliers are utilized in time step 6? (Write the Integer value only)

2

✓ Correct 2/2 Points

9

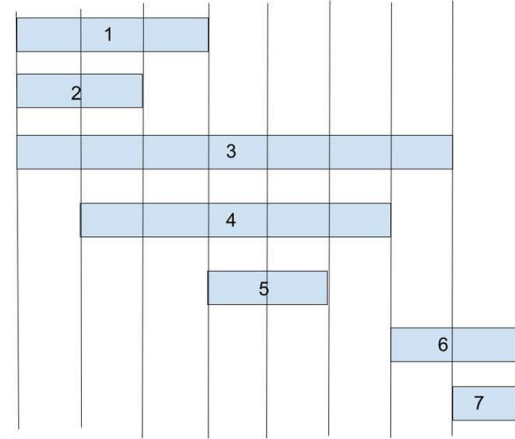
(Figure 4) The start time of operation 8 is (Write the Integer value only)

4

✓ **Correct** 2/2 Points

10

After applying the left edge algorithm, find the minimum number of colors required in the interval graph (Write the Integer value only)

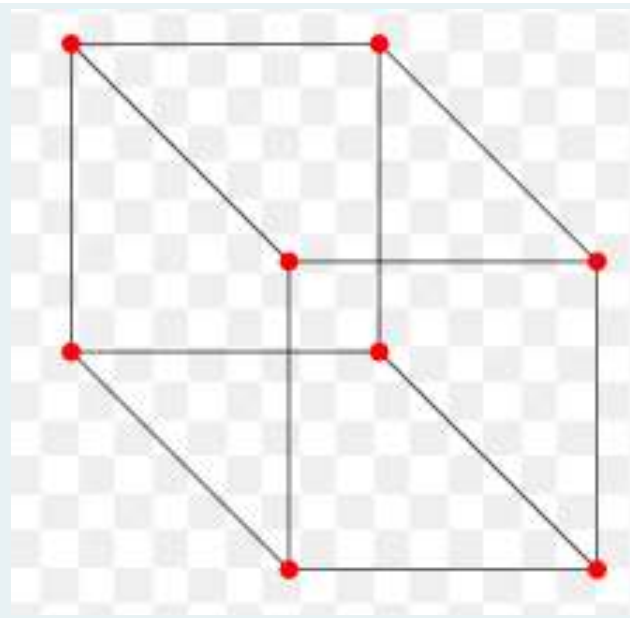


4

✓ **Correct** 2/2 Points

11

Chromatic number of the given figure is (Write the Integer value only)



2

✓ **Correct** 2/2 Points

12

For non-hierarchical sequence graphs, the conflict graph is an interval graph and using the Left-edge algorithm it is Polynomial time solvable

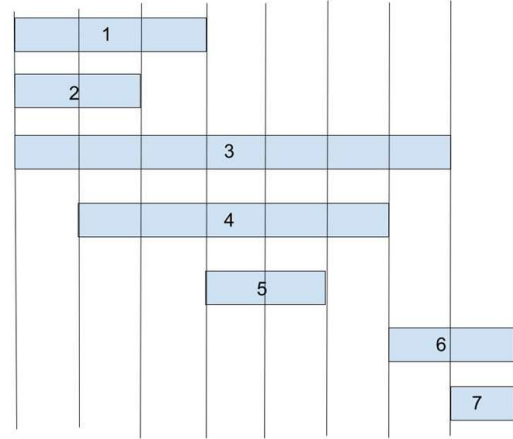
☐ False

☒ True

✓ Correct 2/2 Points

13

Consider the sorted order of the intervals as 1, 2, 3, 4, 5, 6, 7. After applying the left edge algorithm, color one will be assigned to the following nodes:



☐ b. 1, 5, 7

☐ d. 2, 5, 7

☒ a. 1, 5, 6

☐ c. 2, 5, 6

✓ Correct 2/2 Points

14

Which of the following statements are correct in allocation and binding?

S1: Functional unit binding problem can be mapped to graph coloring problem of conflict graph.

S2: Functional unit binding problem can be mapped to graph coloring problem of compatibility graph.

S3: Functional unit binding problem can be mapped to clique cover problem of compatibility graph.

S4: Functional unit binding problem can be mapped to clique cover problem of conflict graph.

☐ (d) Both S2 and S4

☐ (b) Both S1 and S4

☒ (a) Both S1 and S3

☐ (c) Both S2 and S3

✓ Correct 2/2 Points

15

(Figure 4) The candidate operations of ADD type in time step 3 (i.e, the operations that are ready to be scheduled in time step 3) are

☐ (d) 3, 8, 9

☐ (c) 3, 6, 8

☐ (b) 1, 3, 6

☒ (a) 6, 8, 9

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