

1. What Does This Program Do - Looping

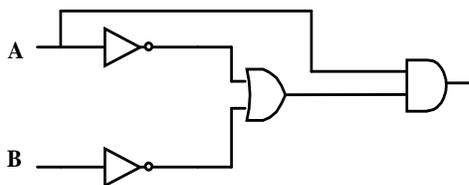
When the following program is run, what is the last element of array B that is modified?

```

FOR J =5 TO 1 STEP -1
  FOR K = 3 TO 10 STEP 2
    B(J,K) = J + K
  NEXT K
NEXT J
    
```

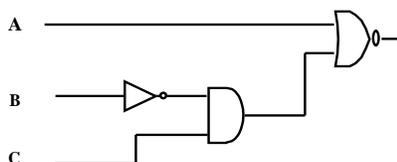
2. Digital Electronics

Write the Boolean expression that is the exact translation of the following circuit:



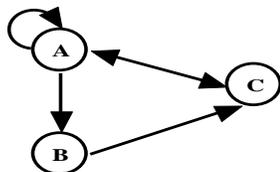
3. Digital Electronics

Find all ordered triplets (A,B,C) that make the following circuit TRUE.



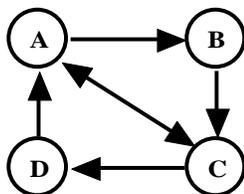
4. Graph Theory

How many different paths of length 2 exist in the following directed graph?



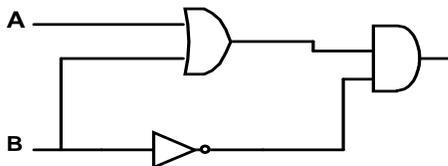
5. Graph Theory

How many cycles exist in the following directed graph?



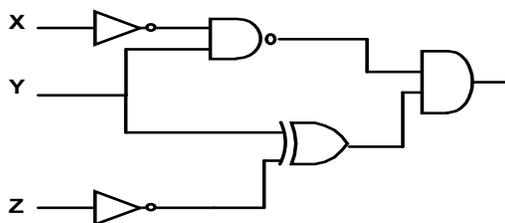
6. Digital Electronics

Find all ordered pairs (A,B) that make the following circuit TRUE.



7. Digital Electronics

Translate the circuit to a Boolean expression and simplify.



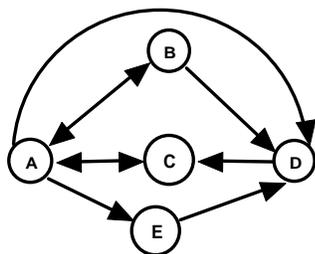
8. Boolean Algebra

Simplify so that only AND and NOT symbols are used

$$\overline{A} (\overline{B} + \overline{C}) + \overline{B} (\overline{A} + \overline{C}) + \overline{C} (\overline{A} + \overline{B})$$

9. Graph Theory

Which of the following are simple paths in the following diagram?



- A) ECAD
- B) BCABD
- C) EDCAB
- D) CADCB
- E) None of the above

10. Graph Theory

Write the adjacency matrix for the following graph.

