

※ 注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

- (2%) Is the following statement true (T) or false (F)? "5G is the next generation of radio systems and network architecture that delivers extreme broadband, ultra-robust, low latency connectivity, and massive networking for the Internet of Things."
- (2%) Is the following statement true (T) or false (F)? "GPU has become one of the most important types of computing technology, known for graphics and widely used in gaming or nowadays training Machine Learning models. It is designed for parallel processing."
- (2%) Is the following statement true (T) or false (F)? "JPEG is a commonly used method of lossless compression for digital images."
- (2%) Is the following statement true (T) or false (F)? "The seven layers of OSI from lowest-level to highest-level are the Physical Layer, the Transport Layer, the Data Link Layer, the Network Layer, the Session Layer, the Presentation Layer, and the Application Layer."
- (2%) "Deep learning is a subset of Machine Learning and Machine Learning is a subset of artificial intelligence that uses algorithms to learn patterns from data."

- (10%) Simply the boolean algebra equation. Which of the following expression is equivalent to  $CD+D(CAA+BB)$ ?  
 (A)  $D+B+A$ ; (B)  $D+B$ ; (C)  $CD+DB$ .

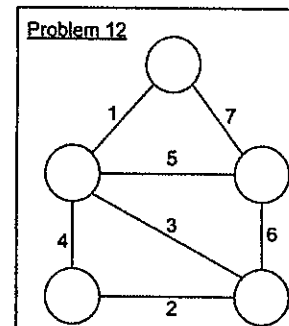
- (10%) We are going to send the string "successes" over a network using Huffman coding. So we first compute the character frequencies, {s: 4, u: 1, c: 2, e: 2}, and then derive the Huffman code. How many bits do we need to send the string?  
 (A) 17 bits; (B) 20 bits; (C) 32 bits.

- (10%) What is the output of the code about the stack shown on the right?  
 (A)  $x=6$   
 $y=11$   
 (B)  $x=11$   
 $y=6$

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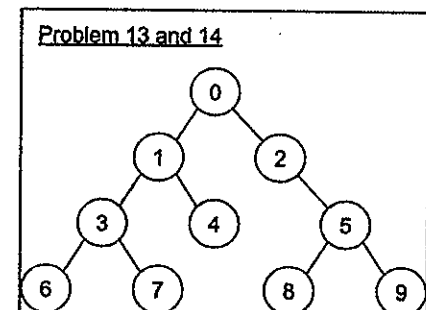
Problem 8
stackType<int> stack;
int x, y;
x = 5;
y = 3;
stack.push(4);
stack.push(x);
stack.push(x + 1);
y = stack.top();
stack.pop();
stack.push(x + y);
x = stack.top();
cout << "x = " << x << endl; cout << "y = " << y << endl;
    
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- (10%) What is the necessary condition for a deadlock situation?  
 (A) Mutual exclusion; (B) No preemption; (C) Hold and wait; (D) Circular set; (E) All the above.
- (10%) Convert the decimal number 32 into binary representation.  
 (A) 00100001; (B) 00100000; (C) 01000000.



- (10%) Choose the recursive formula for the Fibonacci series. ( $n \geq 1$ )  
 (A)  $F(n) = F(n+1) + F(n+2)$ ; (B)  $F(n) = F(n) + F(n+1)$ ; (C)  $F(n) = F(n-1) + F(n-2)$ ; (D)  $F(n) = F(n-1) - F(n-2)$ .
- (10%) What is the minimum cost spanning tree for the graph on the right?  
 (A) 28; (B) 11; (C) 13.

- (10%) Here is a binary tree as shown on the right. What is the postorder traversal of this binary tree?  
 (A) 0136742689; (B) 6371402859; (C) 6734189520.



- (10%) What is the inorder traversal of the same binary tree shown above?  
 (A) 0136742689; (B) 6371402859; (C) 6734189520.