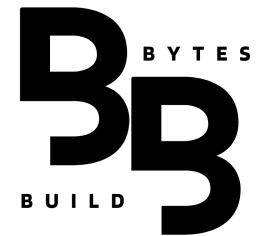


50. The algorithm design technique used in quick sort algorithm is?

Choose the correct answer

- A. Dynamic programming
- B. Back tracking
- C. Divide and conquer**
- D. Greedy search



51. How can call to an overloaded function be ambiguous?

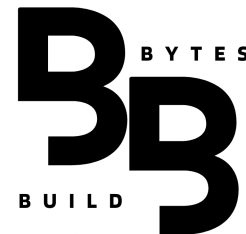


- A. By misspelling the name
- B. There might be two or more functions with the same name
- C. There might be two or more functions with equally appropriate signatures**
- D. none of these

52. Consider the given statement for their correctness with respect to stacks data structure

1. Stacks follow a LIFO approach
2. Stacks are used to convert binary numbers to corresponding decimal numbers.
3. Stacks use two pointers for performing PUSH and POP respectively

- A. TTF
- B. TTT
- C. TFF
- D. FTF

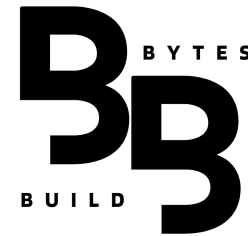


53. Which of the following options gives the lower bound on running time for an algorithm?



- A. Best case complexity of the algorithm
- B. Average case complexity of the algorithm
- C. Worst case complexity of the algorithm**
- D. Number of iterations taking place in the algorithm

```
54. function main() {
    integer i=0.7
    static float m=0.7
    if (m equals i)
print "we are Equal"
    else if( m>i )
print "I am greater"
    else
print "I am lesser"
}
```



- A. We are equal
- B. **I am greater**
- C. I am lesser
- D. This code will generate an error

55. Consider an array on which bubble sort is used. The bubble sort would compare the element  $A[x]$  to which of the following elements in a single iteration?

- A.  $A[x+1]$
- B.  $A[x+2]$
- C.  $A[x+2x]$
- D. All of these**

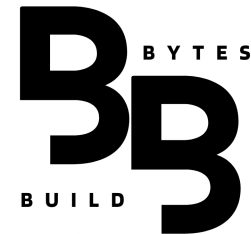


56. Choose the correct answer. Consider the statement

```
while (a < 10.0) {  
  a = a*a  
}
```

Assuming a is positive, for what value of a will this code statement result in an infinite loop?

- A. **a < 1.0**
- B. a <sqrt (10)
- C. a >sqrt (10)
- D. a = 0



57. Choose the correct answer. Ankita takes as input 2 integer numbers, a and b, whose value can be between 0 and 31. He stores them as 5 bit numbers. He writes the following code to process these numbers to produce a third number c.

$$c = 2*(a - b)$$

In how many minimum bits should Ankita store c?

- A. 6 bits
- B. 7 bits**
- C. 8 bits
- D. 9 bits

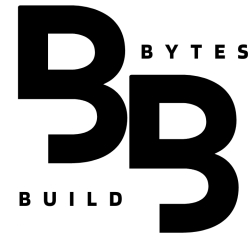




58. Recursive function is executed in a

---

- A. Last in First Out Order**
- B. First in First Out Order
- C. Parallel Fashion
- D. All of the above



59. Yukta created an interface to use it in different parts of the program by implementing it. But she forgot to specify the access specifier for each contained method. What will be the access specifier of the methods that will be inherited/implemented?

**A. Public**

B. Private

C. Protected

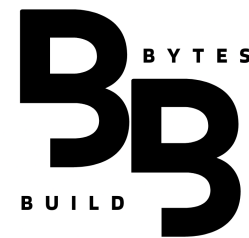
D. An error will be generated



60. Which of the following statements are true?

- 1) An Arithmetic left shift multiplies a signed number by two
- 2) An Arithmetic right shift divides a signed number by two
- 3) Mask operation is an AND micro-operation and insert is an OR micro-operation
- 4) In a logical shift, the serial input to the shift is one

- A. Both 1 and 2
- B. Both 3 and 4
- C. **1, 2 and 3**
- D. 2, 3 and 4



61. Choose the correct answer. A Queue is implemented by a linear array of size 10 (and not as a circularly connected array). Front and Rear are represented as an index in the array. To add an element, the rear index is incremented and the element is added. To delete an element, the front index is incremented. The following operations are done on an empty queue.

ADD 1; DELETE; ADD 2; ADD 3; ADD 4; DELETE, DELETE.

After this set of operations, what is the maximum capacity of the queue?

A. 6

**B. 7**

C. 10

D. None of these

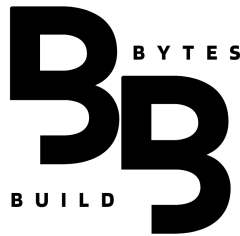
62. A 8-bit signed integer has the following range?

A. 0 to 255

B. **-128 to 127**

C. -255 to 254

D. 0 to 509



63. Pankaj makes a program to print the product of cubes of the first 10 whole numbers

She writes the following program:

```
integer x = 0 // statement 1
integer sum = 0 // statement 2
while ( x < 10 ) // statement 3
{
sum = x*x*x // statement 4
x = x + 1 // statement 5
}
print sum // statement 6
```



Is her program correct? If not, which statement will you modify to correct it?

- A. No error, the program is correct      B. Statement 1
- C. **Statement 4**      D. statement 6

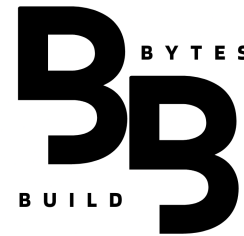
64. Here is an infix notation:  $((A+B)*C-(D-E))^{(F+G)}$   
Choose the correct postfix notation of the above from the given options?

A.  $AB+CD*E-FG+^{\wedge}$

B.  $AB+C*DE-FG+^{\wedge}$

C.  $AB+C*DE-FG-+^{\wedge}$

D.  $A+BC*DE-FG-+^{\wedge}$



65. One of the following options is a form of access used to add and remove nodes from a queue.

A. LIFO

**B. FIFO**

C. Both LIFO and FIFO

D. None of these





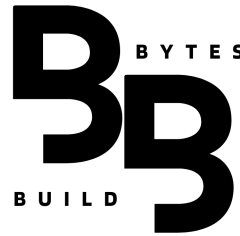
66. What is the time complexity of adding three matrices of size  $N \times N$  cell-by-cell?

A.  $O(N)$

B.  $O(N^2)$

C.  $O(N^3)$

D. None of these



67. What is the output of the pseudocode statements given below?

(Note: Assume that when two data types are processed through an operator, the answer maintains the same data type as that of the input. Also, all data types have enough range to accommodate any number. If two different data types are operated upon, the result assumes the data type that is more expressive.)

```
integer a=984, b=10
```

```
//float is a data type to store real numbers.
```

```
float c
```

```
c = a / b
```

```
print c
```

A. 984

B. 98.4

**C. 98**



68. What will be the output generated when the given code is executed? A pseudo-code is used which is self explanatory.

```
function main()
{
integer a=5
switch(a)
{
default: print "hello"
case 5:  print "How are you?"
break

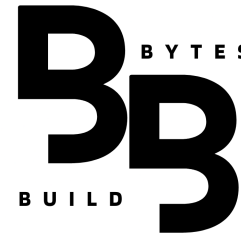
}
}
```

A. hello

**B. How are you**

C. HelloHow are you?

D. This code will generate a compile time error



69. A language has 28 different letters in total. Each word in the language consists of a maximum of 7 letters. A programmer wants to create a data type to store a word of this language. She decides to store the word as an array of letters. How many bits should she assign to the data type to store all kinds of words of the language?

- A. 7
- B. 35**
- C. 28
- D. 196



70. How can the largest number in a list of twenty numbers be found?

A. Use bubble sort to sort the list in a descending order and then print the first number of the series

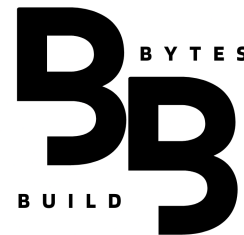
B. Use selection sort to sort the list in a descending order and then print the first number of the series

**C. Implement one iteration of selection sort for descending order and print the first number in the series**

D. None of the above

71. A programmer writes an efficient program to sum two square diagonal matrices (matrices with elements only on the diagonal positions). The size of each matrix is  $n \times n$ . What is the time complexity of the algorithm?

- A.  $O(n^2)$
- B.  **$O(n)$**
- C.  $O(n \cdot \log(n))$
- D. None of the above



72. How many nodes does a full binary tree with “n” leaves contain?

- A.  $2n + 1$  nodes
- B.  $\log_2 n$  nodes
- C.  $2n - 1$  nodes**
- D.  $2n$  nodes



73. Refer to the pseudocode given in the 'Passage'. The code is similar to that in C++ and is self-explanatory. An accessible member function and a data member for an object are accessed by the statements *objectname.functionname* and *objectname.datamembername*, respectively. Which statement should be deleted from the code to rectify the error in it ?

- A. Statement 1
- B. Statement 2
- C. Statement 3
- D. Statement 4**



74. The following values are to be stored in a hash Table-15,22,41,19,102,18,37

Using the division method of hashing with a table size of 10 (use sequential method of resolving collision), give the contents of Hash Table.

A. 41,22,102,15,37,18,19,Null, Null, Null

B. Null, Null, Null,41,22,102,15,37,18,19

C. 41,22,102,15,37,18,19

**D. Null,41,22,102,Null, 15,Null, 37,18,19**

75. Consider the code given below. How many times will “Hello” be printed if  $m < n$  and exactly one of  $(m, n)$  is even?

```
for i = m to n increment 2  
{ print “Hello!” }
```

A.  $(n - m + 1)/2$

**B.  $1 + (n - m)/2$**

C.  $1 + (n - m)/2$  if  $m$  is even,  $(n - m + 1)/2$  if  $m$  is odd

D.  $(n - m + 1)/2$  if  $m$  is even,  $1 + (n - m)/2$  if  $m$  is odd

1.Q) What will the output of the following pseudo code statements be?

(Note: Assume that when two data types are processed through an operator, the answer maintains the same data type as that of the input. Also, all data types have enough range to accommodate any number. If two different data types are operated upon, the result assumes the data type that is more expressive.)

Integer a = 456, b, c, d = 10

b = a/d

c = a - b

print c

A.410

B. 410.4

C. 411.4

**D. 411**

2.Q) The function given below takes a number “n” as the input and calculates the sum of first “n” natural numbers. Which of the following statements should be inserted in place of “??” to get the required output?

```
function sum(n)
{
if (??)
return 1
else
return (n + sum(n-1))
end
}
```

- A. n equals 1**
- B. n equals 2
- C.  $n \geq 1$
- D.  $n > 1$

3.Q) Which of the following implies that there are two loops that are nested?

- A. Two loops, one after the other
- B. Two loops, one inside the other**
- C. One loop with two different iteration counts
- D. Two loop with the same iteration count

Choose the correct answer.

Passage

```
function main()  
{  
static integer abc = 5  
print abc—  
if ( abc )  
main() // calling main function  
}
```

Choose the correct answer:

A pseudo-code is used which is self explanatory.

// in pseudo code refers to comment

4.Q) What will be the output of the given code?

A. 43210

**B. 54321**

C. This code will enter an infinite loop

D. This code will generate an error

5.Q) The function given below takes an even integer “n” as the input and calculates the sum of first “n” even natural numbers. The function is called by the statement “sum (30)”. How many times will the function “sum” be called to compute the sum?

```
function sum(n)
{
if (n equals 2)
return 2
else
return (n + sum(n-2))
end
}
```

- A. 1
- B. 30
- C. 15**
- D. 16

Passage

Class rocket

```
{
private:
integer height, weight
public: \\statement 1
function input a, int b)
{
height = a;
weight = b;
}
}
function main( )
{
Rocket rocket1, rocket2
}
```



6.Q) Refer to the pseudocode given in the 'Passage'. The code is similar to that in C++ and is self-explanatory. An accessible member Function and a data member for an object are accessed by the statements objectname.Functionname and objectname.Datamemnername, respectively.

What can be inferred from this code?

- A. "rocket" is a class with "rocket1" and "rocket2" as its objects, with "height" and "weight" as its attributes.**
- B. "rocket" is a class with "rocket1" and "rocket2" as its objects, with "height" and "weight" as its objects.
- C. "rocket" is a class with "rocket1" and "rocket2", "height" and "weight" as its attributes.
- D. "rocket" is a class with "rocket1" and "rocket2", "height" and "weight" as its objects.

7.Q) In which of the following situations can a constructor be invoked?

**A. When an object is created**

B. When an object is assigned the value 0

C. Only at the end of the code

D. When the scope of the object is over

8.Q) What will happen if some indentations are made in some statements of a code written in C++?

- A. Faster execution of the code
- B. Lower memory requirement for the code
- C. Correction of errors in the code
- D. Better readability of the code.**

9.Q) In an implementation of a linked list, each node contains data and address. Which of the following can the address field possibly contain?

**A. Address of the next node in sequence**

B. Its own address

C. Address of the last node

D. Address of the first node

10.Q) Consider the structure of a queue as given below

–

FRONT = 2, REAR = 4

Queue: \_, L, M, N, \_

What will be the values of FRONT and REAR respectively after the insertion of an element 'Q' in the given queue?

A. 1,4

**B. 2,5**

C. 1,5

D. 2,4

12.Q) Which of the following can be inherited by a derived class from a base class?

- A. Data members
- B. Member functions
- C. Constructors and destructors
- D. Data members and member functions**

13.Q) A programmer wants the program given below to print the largest number out of three numbers entered by the user.

```
int number1, number 2, number 3, temp;  
input number 1, number 2, number 3;  
if(number1>number2)  
temp = number 1  
else  
temp = number 2  
end if  
if(??) // Statement 1  
temp = number 3  
end if  
print temp
```

Which of the following should be substituted in place of “??” in Statement 1 in the code?

- A. number3> number2
- B. number3> temp**
- C. number3> temp
- D. number3> number1

14.Q) Which of the given function prototypes can be considered to be overloaded (no ambiguity)?

**A. function my Func(integer Num, float me) // does not return anything**

B. function my Func(integer Num, double me) // does not return anything

C. function my Func(character Num, float me) // does not return anything

**D. function my Func(integer Num, float me) // return an integer**

Passage

```
function moify(y,z)
```

```
{
```

```
y = y + 1;
```

```
z = z + 1;
```

```
return y - z
```

```
}
```

```
function calculate ( )
```

```
{
```

```
integer a = 5, b = 10, c
```

```
c = modify (a, b);
```

```
print a
```

```
print space
```

```
print c
```

```
{
```



15.Q) Consider the code given in the 'Passage'. Assume that "a" and "b" are passed by value. What will the output of the program be when the function calculate () is executed?

- A. 11 -5
- B. 10 -5
- C. 6 -5
- D. 5 -5**

Passage

```
function preordertraverse(node)
{
print node      value
if (condition x)
{ preordertraverse(node      left)}
if condition y)
{ preordertraverse(node      right)}
return
}
```

16.Q) Consider a binary tree implementation. The root address is stored in the variable root. The address of a node is given in the variable node. The value of the node and its right and left child nodes can be accessed using the statements given below.

node → value,  
node → right,  
node → left.

A programmer writes the function given in the 'Passage' to do a preorder traversal of the tree.

What are Condition X and Condition Y ?

- A. **Condition X: node → left is not equal**  
**Condition Y: node → right is not equal**
- B. Condition X: node → right is not equal  
Condition Y: node → left is not equal
- C. Condition X: node → left is equal  
Condition Y: node → right is equal
- D. Condition X: node → right is equal  
Condition Y: node → left is equal

17. Q) The following operations are performed on an empty R “A”.

PUSH( 1)

PUSH (2)

POP

PUSH(5)

PUSH(6)

POP

What will the stack contain after these operations?

(Note: The top of the stack is underlined in the options below.)

A. 5 6

B. 1 5

C. 5 6

D. 1 5

18.Q) How many nodes does a full binary tree with “n” non-leaf nodes contain?

A.  $\log n$

B.  $n + 1$

**C.  $2n + 1$**

D.  $2n$

19.Q) A programmer mistakenly writes “gor” instead of the keyword “for” used in loops. While writing a program in C++. What will this result in ?

**A. The code would not compile.**

B. The code would give an error while execution.

C. The code may work for some inputs and not for the others.

D. The code would not create any problem.

20.Q) Every element of a data structure has an address and a key associated with it. A search mechanism deals with two or more values assigned to the same address by using the key. What is this search mechanism?

- A. Linear search
- B. Binary search
- C. Hash coded search**
- D. None of the above

21.Q) Which of the following abstract data types can be used to represent a many-to-many relation?

- A. Tree
- B. Stack
- C. Graph**
- D. Queue

22.Q) Why is an algorithm designer concerned primarily about the run time and not the compile time while calculating time complexity of an algorithm?

**A. Run time is always more than the compile time.**

B. Compile time is always more than the run time.

C. Compile time is a function of run time.

D. A program needs to be compiled once but can be run several times.

Passage

```
Function main()
```

```
{
```

```
Automatic variable var
```

```
Print var
```

```
}
```

Choose the correct answer.

A pseudo-code is used which is self explanatory.



23.Q) What will be the output generated when the given code is executed?

A. 0

B. 1

**C. Garbage Value**

D. This code will generate a compile time error

24. Q) In which of the following methods is sorting NOT possible?

- A. Insertion
- B. Selection
- C. Exchange
- D. Deletion**