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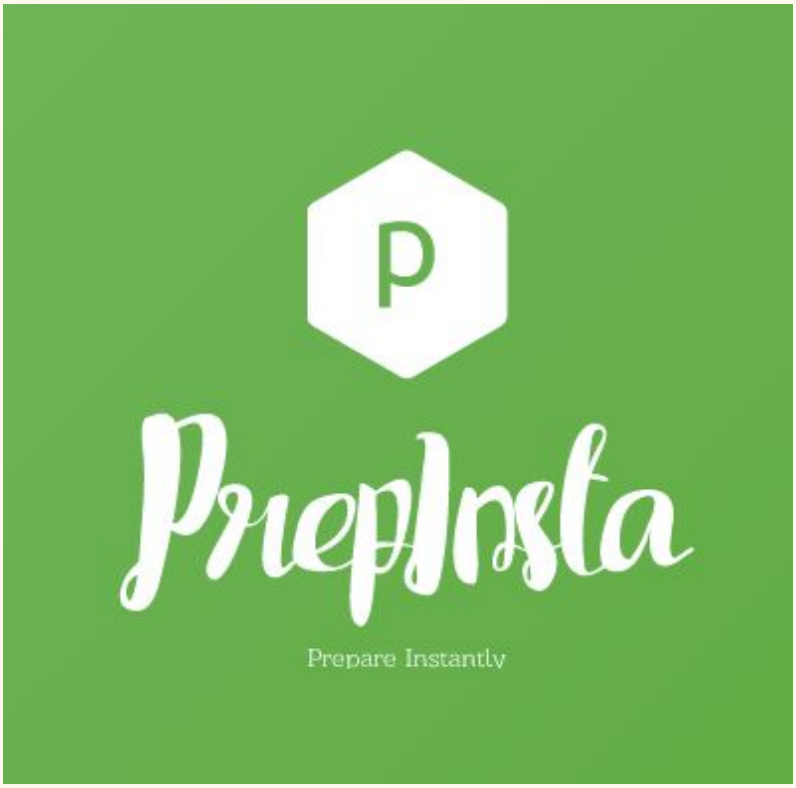
Computer Programing - Programming

mPhasis Study materials 2018



Important Note - Expiry of this PDF is 31st September 2018 and this PDF will be of very limited use(or No USE). Thus will suggest buying new one if you're using this post 31st September 2018.

Also, don't share this PDF with anyone as if they will score good marks too your percentile will get decreased. Our preparation guide and sample questions will help you a lot.

QUANTS-

Topics	Subtopics	Expected Questions
Basic Mathematics	• Divisibility • HCF and LCM • Numbers, decimal fractions and power	6 - 8 Questions
Applied Mathematics	• Profit & Loss ,Simple & Compound Interest • Time, Speed and Distance • Work & Time • Ration & Allegation	8 - 10 Questions
Engineering Mathematics	• Logarithms • Permutation and Combinations • Probability	8 - 10 Questions

COMPUTER Programming

Topics	Subtopics	Expected Questions
Basic Programming	• Data Types • Iteration, Recursion, Decision • Procedure, functions and scope	10 - 12 Questions
Data Structures	• Arrays, Linked Lists, Trees, Graphs • Stacks, Queues • Hash Tables • Heaps	6 - 8 Questions
OOPs	• Polymorphism • Abstraction • Encapsulation	4 - 6 Questions
Miscellaneous	• Searching and Sorting • Complexity Theory • Core Computer Science	4 - 5 Questions

ENGLISH

Topics	Subtopics	Expected Questions
Vocabulary	• Synonyms • Antonyms • Sentence based Synonyms • Sentence based Antonyms	7 - 8 Questions
Grammar	• Subject-Verb Agreement • Tenses and Articles • Prepositions and Conjunctions • Speech and Voices	10 - 12 Questions
Comprehension	• Inferential and Literal Comprehension • Contextual Vocabulary • Comprehension ordering	5 Questions

LOGICAL REASONING

Topics	Subtopics	Expected Questions
Deductive Reasoning	• Coding deductive logic • Blood Relation • Directional Sense • Objective Reasoning • Selection decision tables	5 Questions
Inductive reasoning	• Analogy and Classification pattern recognition • Coding pattern and Number series pattern recognition	5 Questions
Abductive Reasoning	• Logical word sequence • Data sufficiency	6 Questions

If you take lesser time than designated for a question for e.g. if there are 16 question in quants and total time is 18 mins.

Thus, total time for one question = 67 seconds.

If for quants any question is solved 10 seconds before i.e 57 seconds you get +15 points.

Similarly, if it is solved after 77 seconds - 5 points

Ques0. There is a new data-type which can take as values natural numbers between (and including) 0 and 25. How many minimum bits are required to store this datatype.

Op 1: 4

Op 2: 5

Op 3: 1

Op 4: 3

Op 5:

Correct Op : 2

Ques1. A data type is stored as an 6 bit signed integer. Which of the following cannot be represented by this data type?

Op 1: -12

Op 2: 0

Op 3: 32

Op 4: 18

Op 5:

Correct Op : 3

Ques3. A language has 28 different letters in total. Each word in the language is composed of maximum 7 letters. You want to create a data-type to store a word of

this language. You decide to store the word as an array of letters. How many bits will you assign to the data-type to be able to store all kinds of words of the language.

Op 1: 7

Op 2: 35

Op 3: 28

Op 4: 196

Op 5:

Correct Op : 2

Ques4. A 10-bit unsigned integer has the following range:

Op 1: 0 to 1000

Op 2: 0 to 1024

Op 3: 1 to 1025

Op 4: 0 to 1023

Op 5:

Correct Op : 4

Ques5. Rajni wants to create a data-type for the number of books in her book case. Her shelf can accommodate a maximum of 75 books. She allocates 7 bits to the datatype. Later another shelf is added to her book-case. She realizes that she can still use the same data-type for storing the number of books in her book-case. What is the maximum possible capacity of her new added shelf?

Op 1: 52

Op 2: 127

Op 3: 53

Op 4: 75

Op 5:

Correct Op : 1

Ques6. A new language has 15 possible letters, 8 different kinds of punctuation marks and a blank character. Rahul wants to create two data types, first one which could store the letters of the language and a second one which could store any character in the language. The number of bits required to store these two data-types will respectively be:

Op 1: 3 and 4

Op 2: 4 and 3

Op 3: 4 and 5

Op 4: 3 and 5

Op 5:

Correct Op : 3

Ques7. Parul takes as input two numbers: a and b. a and b can take integer values between 0 and 255. She stores a, b and c as 1-byte data type. She writes the following code statement to process a and b and put the result in c.

c = a + 2*b

To her surprise her program gives the right output with some input values of a and b,

while gives an erroneous answer for others. For which of the following inputs will it give a wrong answer?

Op 1: a = 10 b = 200

Op 2: a = 200 b = 10

Op 3: a = 50 b = 100

Op 4: a = 100 b = 50

Op 5:

Correct Op : 1

Ques8. Prashant takes as input 2 integer numbers, a and b, whose value can be between 0 and 127. He stores them as 7 bit numbers. He writes the following code to process these numbers to produce a third number c.

c = a - b

In how many minimum bits should Prashant store c?

Op 1: 6 bits

Op 2: 7 bits

Op 3: 8 bits

Op 4: 9 bits

Op 5:

Correct Op : 3

Ques9. 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?

Op 1: 6 bits

Op 2: 7 bits

Op 3: 8 bits

Op 4: 9 bits

Op 5:

Correct Op : 2

Ques10. A character in new programming language is stored in 2 bytes. A string is represented as an array of characters. A word is stored as a string. Each byte in the memory has an address. The word "Mahatma Gandhi" is stored in the memory with starting address 456. The letter 'd' will be at which memory address?

Op 1: 468

Op 2: 480

Op 3: 478

Op 4: 467

Op 5:

Correct Op : 3

Ques11. Stuti is making a questionnaire of True-false questions. She wants to define a

data-type which stores the response of the candidate for the question. What is the most-suited data type for this purpose?

Op 1: integer

Op 2: boolean

Op 3: float

Op 4: character

Op 5:

Correct Op : 2

Ques12. What will be the output of the following pseudo-code statements:

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

b = a/d

c = a - b

print c

Op 1: 410

Op 2: 410.4

Op 3: 411.4

Op 4: 411

Op 5:

Correct Op : 4

Ques13. What will be the output of the following pseudo-code statements:

integer a = 984, b, c, d =10

print remainder(a,d) // remainder when a is divided by d

a = a/d

print remainder(a,d) // remainder when a is divided by d

Op 1: 48

Op 2: Error

Op 3: 84

Op 4: 44

Op 5:

Correct Op : 1

Ques. What will be the output of the following code statements?

integer a = 50, b = 25, c = 0

print (a > 45 OR b > 50 AND c > 10)

Op 1: 1

Op 2: 0

Op 3: -1

Op 4: 10

Op 5:

Correct Op : 1

Ques14. What will be the output of the following code statements?

integer a = 50, b = 25, c = 5

print a * b / c + c

Op 1: 120

Op 2: 125

Op 3: 255

Op 4: 250

Op 5:

Correct Op : 3

Ques15. What will be the output of the following code statements?

integer a = 10, b = 35, c = 5

print a * b / c - c

Op 1: 65

Op 2: 60

Op 3: Error

Op 4: 70

Op 5:

Correct Op : 1

Ques16. integer a = 10, b = 35, c = 5

Comment about the output of the two statements?

print a * b + c / d

print c / d + a * b

Op 1: Differ due to left-to-right precedence

Op 2: Differ by 10

Op 3: Differ by 20

Op 4: Same

Op 5:

Correct Op : 4

Ques17. integer a = 40, b = 35, c = 20, d = 10

Comment about the output of the following two statements:

print a * b / c - d

print a * b / (c - d)

Op 1: Differ by 80

Op 2: Same

Op 3: Differ by 50

Op 4: Differ by 160

Op 5:

Correct Op : 1

Ques18. integer a = 60, b = 35, c = -30

What will be the output of the following two statements:

print (a > 45 OR b > 50 AND c > 10)

print ((a > 45 OR b > 50) AND c > 10)

Op 1: 0 and 1

Op 1: No error, the program is correct.

Op 2: Statement 1

Op 3: Statement 4

Op 4: statement 6

Op 5:

Correct Op : 3

Ques22. Shashi wants to make a program to print the sum of the first 10 multiples of 5.

She writes the following program, where statement 5 is missing:

```
integer i = 0
integer sum = 0
while ( i <= 50 )
{
sum = sum + i
-- MISSING STATEMENT 5 --
}
print sum
```

Which of the following will you use for statement 5?

Op 1: i = 5

Op 2: i = 5 * i

Op 3: i = i + 1

Op 4: i = i + 5

Op 5:

Correct Op : 4

Ques23. Shantanu wants to make a program to print the sum of the first 7 multiples of

6. He writes the following program:

integer i = 0 // statement 1

integer sum // statement 2

while (i <= 42) // statement 3

{

sum = sum + i // statement 4

i = i + 6;

}

print sum // statement 6

Does this program have an error? If yes, which one statement will you modify to correct the program?

Op 1: Statement 1

Op 2: Statement 2

Op 3: Statement 3

Op 4: Statement 4

Op 5:

Correct Op : 2

Ques24. Sharmili wants to make a program to print the sum of all perfect cubes, where the value of the cubes go from 0 to 100. She writes the following program:

integer i = 0, a // statement 1

integer sum = 0;

a = (i * i * i)

while (i < 100) // statement 2

```
{
sum = sum + a // statement 3
i = i + 1
a = ( i * i * i ) // statement 4
}
print sum
```

Does this program have an error? If yes, which one statement will you modify to correct the program?

Op 1: Statement 1

Op 2: Statement 2

Op 3: Statement 3

Op 4: Statement 4

Op 5: No error

Correct Op : 2

Ques25. Bhavya wants to make a program to print the sum of all perfect squares, where the value of the squares go from 0 to 50. She writes the following program:

```
integer i = 1, a // statement 1
integer sum = 0
while ( a < 50 ) // statement 2
{
sum = sum + a // statement 3
i = i + 1
a = ( i * i ); // statement 4
```

}

print sum

Does this program have an error? If yes, which one statement will you modify to

correct the program?

Op 1: Statement 1

Op 2: Statement 2

Op 3: Statement 3

Op 4: Statement 4

Op 5: No error

Correct Op : 1

Ques26. Vijay wants to print the following pattern on the screen:

2

2 4

2 4 6

2 4 6 8

He writes the following program:

integer i = 1, j=2 // statement 1

while (i <= 4) // statement 2

{

j = 2;

while (j <= ?) // Statement 3

{

print j

print blank space

j = j + 2

}

print end-of-line \takes the cursor to the next line

i = i + 1

}

What is the value of ? in statement 3 ::

Op 1: 8

Op 2: i

Op 3: 2*i

Op 4: 4

Op 5:

Correct Op : 3

Ques27. Shravanti writes the following program:

integer i = 0, j

while (i < 2)

{j = 0;

while (j <= 3*i)

{print j

print blank space

j = j + 3}

print end-of-line \takes the cursor to the next line

i = i + 1

}

What will be the output of the program?

Op 1: 0

0 3

Op 2: 0 3

0 3 6

Op 3: 0

0 3 6

0 3 6 9

Op 4: 0 3 6

0 3 6 9

0 3 6 9 12

Op 5:

Correct Op : 1

Ques28. Vijay wants to print the following pattern on the screen:

1

1 2

1 2 3

He writes the following program:

integer i = 1 // statement 1

```
while ( i <= 3 )
{
int j // Statement 2
while ( j <= i ) // Statement 3
{
print j
print blank space
j = j + 1 // Statement 4
}
print end-of-line \takes the cursor to the next line
i = i + 1
}
```

Will this program function correctly? If not which one statement will you modify to make the program function correctly?

Op 1: Statement 1

Op 2: Statement 2

Op 3: Statement 3

Op 4: Statement 4

Op 5: Program does not have error.

Correct Op : 2

Ques29. Charu writes the following program:

```
integer i = 1, j, a
while ( i <= 4 )
```

```
{
j = 1;
a = 0;
while ( a <= 5*i )
{
 a = 2^j;
 print a
 print blank space
 j = j + 1
}
print end-of-line \takes the cursor to the next line
i = i + 1
}
```

What will be the output of the program?

Op 1: 2
2 4
2 4 8
2 4 8 16

Op 2: 2 4
2 4 8
2 4 8 16
2 4 8 16 32

Op 3: 2 4
2 4 8
2 4 8
2 4 8 16

Op 4: 2
2 4
2 4
2 4 8 16

Op 5:

Correct Op : 3

Ques30. Himanshu wants to write a program to print the larger of the two inputted number. He writes the following code:

```
int number1, number 2
```

input number1, number 2
if (??) // Statement 1
print number1
else
print number2
end if
Fill in the ?? in statement 1.
Op 1: number1>number2
Op 2: number2>number1
Op 3: number2 equals number1
Op 4: number1 <= number2
Op 5:
Correct Op : 1

Ques31. Shalini wants to program to print the largest number out of three inputted numbers. She writes the following program:
int number1, number 2, number3, temp;
input number1, number2, number3;
if (number1>number2)
temp = number1
else
temp = number2
end if
if (??) // Statement 1
temp = number3
end if
print temp
Fill in the ?? in Statement 1
Op 1: number3 > number2
Op 2: number3 > temp
Op 3: number3 < temp
Op 4: number3 > number1
Op 5:
Correct Op : 2

Ques32. Rohit writes the following program which inputs a number and prints "Double

digit" if the number is composed of two digits and "Not a double digit" if it is not.
int number;
if (number>10 AND number < 100)
print "Double digit"
else
print "Not a double digit"
end if
Rohit tries the following inputs: 5 and 66. The program works fine. He asks his brother Ravi to try the program. When Ravi enters a number, the program doesn't work correctly. What did Ravi enter?
Op 1: 8
Op 2: 100
Op 3: 99
Op 4: 10
Op 5:
Correct Op : 4

Ques33. Rohan writes the following program which inputs a number and prints "Triple digit" if the number is composed of three digits and "Not triple digit" if it is not.
int number;
if (number>99)
print "Triple digit"
else
print "Not triple digit"
end if
Rohan tries the following inputs: 25 and 566. The program works fine. He asks his brother Ravi to try the program. When Ravi enters a number, the program doesn't work correctly. What did Ravi enter?
Op 1: 99
Op 2: 100
Op 3: 0
Op 4: 1000
Op 5:
Correct Op : 4

Ques34. Abhinav wants to find the largest number in a given list of 20 numbers. Which

of the following is an efficient approach to do this?
Op 1: Use bubble sort to sort the list in descending order and then print the first number of the series.
Op 2: Use selection sort to sort the list in descending order and then print the first number of the series.
Op 3: Implement one iteration of selection sort for descending order and print the first number in the series.
Op 4: None of these
Op 5:
Correct Op : 3

Ques35. Lavanya wants to find the smallest number out of 26 inputted numbers. How many minimum comparisons he has to make?
Op 1: 25
Op 2: 13
Op 3: 26
Op 4: 52
Op 5:
Correct Op : 1

Ques36. A company offers commission for selling it products to its salesperson. The commission rate is Rs. 5 per product. However if the salesperson sells more than 200 items, he gets a commission of Rs. 10 on all items he sold after the first 200. Kanu writes a program to calculate the commission for the salesperson:

```
integer numberProducts, commission
input numberProducts
if ( numberProducts > 200 )
-- MISSING STATEMENT --
else
commission = numberProducts * 5
end if
print commission
```

Fill in the missing statement.
Op 1: commission = (numberProducts - 200) * 10
Op 2: commission = 200 * 5 + (numberProducts - 200) * 10
Op 3: commission = numberProducts * 10

Op 4: None of these
Op 5:
Correct Op : 2

Ques37. Vikram wants to write a program which checks whether the inputted number is divisible by any of the first 6 natural numbers (excluding 1). He writes the following efficient code for it.

```
int number, n = 2, isdivisible=0
input number
while ( n <=6) // Statement 1
{
if ( remainder (number, n) == 0)
 isdivisible = 1
end
n = n+1 // Statement 2
}
if (isdivisible equals 1)
print "It is divisible"
else
print "It is not divisible"
end
```

Vikram takes the program to Hari. Hari tells Vikram that though the code is correct, it can be made more efficient. Hari modifies a single statement and makes the code more efficient. Which statement does he modify and how?
Op 1: Statement 1 is changed to:
while (n <=6 AND isdivisible=0)
Op 2: Statement 1 is changed to:
while (n <=6 OR isdivisible=0)
Op 3: Statement 1 is changed to:
while (isdivisible=0)
Op 4: Statement 2 is changed to:
n = n + 2
Op 5:
Correct Op : 1

Ques38. Rajiv wants to make a program which inputs two numbers: a and b (a>b)

and computes the number of terms between a and b (including a and b). What will be code statement to do this:
Op 1: a - b
Op 2: a - b + 1
Op 3: a + b
Op 4: a - b - 1
Op 5:
Correct Op : 2

Ques39. I have a problem to solve which takes as input a number n. The problem has a property that given the solution for (n-1), I can easily solve the problem for n. Which programming technique will I use to solve such a problem?
Op 1: Iteration
Op 2: Decision-making
Op 3: Object Oriented Programming
Op 4: Recursion
Op 5:
Correct Op : 4

Ques40. What is the output of the following code statements? The compiler saves the first integer at the memory location 4062. Integer is one byte long.
integer a
pointer b
a = 20
b = &a
print *b
Op 1: 4062
Op 2: 4063
Op 3: 20
Op 4: 10
Op 5:
Correct Op : 3

Ques41. What is the output of the following code statements? The compiler saves the first integer at the memory location 4165 and the rest at consecutive memory spaces in order of declaration. Integer is one byte long.

integer a, b
pointer c, d
a = 30
c = &a
b = *c
a = a + 10
print b
Op 1: 30
Op 2: 4165
Op 3: 40
Op 4: 4166
Op 5:
Correct Op : 1

Ques42. What is the output of the following code statements? The compiler saves the first integer at the memory location 4165 and the rest at consecutive memory spaces in order of declaration. Integer is one byte long.
integer a
pointer c, d
a = 30
c = &a
d = c
a = a + 10
print *c
Op 1: 30
Op 2: 4165
Op 3: 40
Op 4: 4166
Op 5:
Correct Op : 3

Ques43. What is space complexity of a program?
Op 1: Amount of hard-disk space required to store the program
Op 2: Amount of hard-disk space required to compile the program
Op 3: Amount of memory required by the program to run
Op 4: Amount of memory required for the program to compile

Op 5:
Correct Op : 3

Ques44. The memory space needed by an algorithm has a fixed part independent of the problem instance solved and a variable part which changes according to the problem instance solved. In general, which of these two is of prime concern to an algorithm designer?
Op 1: Fixed part
Op 2: Variable Part
Op 3: Product of fixed part and variable part
Op 4: None of these
Op 5:
Correct Op : 2

Ques45. While calculating time complexity of an algorithm, the designer concerns himself/herself primarily with the run time and not the compile time. Why?
Op 1: Run time is always more than compile time.
Op 2: Compile time is always more than run time.
Op 3: Compile time is a function of run time.
Op 4: A program needs to be compiled once but can be run several times.
Op 5:
Correct Op : 4

Ques46. Pankaj and Mythili were both asked to write the code to evaluate the following expression:
a - b + c/(a-b) + (a-b)2
Pankaj writes the following code statements (Code A):
print (a-b) + c/(a-b) + (a-b)*(a-b)
Mythili writes the following code statements (Code B):
d = (a-b)
print d + c/d + d*d
If the time taken to load a value in a variable, for addition, multiplication or division between two operands is same, which of the following is true?
Op 1: Code A uses lesser memory and is slower than Code B
Op 2: Code A uses lesser memory and is faster than Code B
Op 3: Code A uses more memory and is faster than Code B

Op 4: Code A uses more memory and is slower than Code B
Op 5:
Correct Op : 1

Ques47. Vrinda writes an efficient program to sum two square diagonal matrices (matrices with elements only on diagonal). The size of each matrix is nXn. What is the time complexity of Vrinda's algorithm?
Op 1: &theta(n^2)
Op 2: &theta(n)
Op 3: &theta(n*log(n))
Op 4: None of these
Op 5:
Correct Op : 2

Ques48. Tarang writes an efficient program to add two upper triangular 10X10 matrices (elements on diagonal retained). How many total additions will his program make?
Op 1: 100
Op 2: 55
Op 3: 25
Op 4: 10
Op 5:
Correct Op : 2

Ques49. Ravi and Rupali are asked to write a program to sum the rows of a 2X2 matrices stored in the array A.
Ravi writes the following code (Code A):
for n = 0 to 1
sumRow1[n] = A[n][1] + A[n][2]
end
Rupali writes the following code (Code B):
sumRow1[0] = A[0][1] + A[0][2]
sumRow1[1] = A[1][1] + A[1][2]
Comment upon these codes (Assume no loop-unrolling done by compiler):
Op 1: Code A will execute faster than Code B.
Op 2: Code B will execute faster than Code A
Op 3: Code A is logically incorrect.

Op 4: Code B is logically incorrect.
Op 5:
Correct Op : 2

Ques50. There is an array of size n initialized with 0. Akanksha has to write a code which inserts the value 3k at position 3k in the array, where k=0,1...(till possible). Akanksha writes an efficient code to do so. What is the time complexity of her code?
Op 1: &theta(n^2)
Op 2: &theta(n)
Op 3: &theta(log3(n))
Op 4: &theta(3n
)
Op 5:
Correct Op : 3

Ques51. There are two matrices A and B of size nXn. The data in both these matrices resides only at positions where both the indices are a perfect square. Rest all positions have 0 as the data. Manuj has available a third matrix initialized with 0's at all positions. He writes an efficient code to put the sum of A and B in C. What is the time complexity of Manuj's program?
Op 1: &theta(n^2)
Op 2: &theta(n)
Op 3: &theta(n1/2)
Op 4: &theta(log(n))
Op 5:
Correct Op : 2

Ques52. Ravi has to add an strictly upper triangular (no elements at diagonal) and a strictly lower triangular square matrix (no elements at diagonal) and put the result in a third matrix. What is the time complexity of Ravi's algorithm? Assume that storing a value in a memory space takes negligible time, while each addition between values takes the dominating amount of time.
Op 1: &theta(n^2)
Op 2: &theta(n)
Op 3: &theta(1)
Op 4: None of these

Op 5:
Correct Op : 3

Ques53. We have two 100X3 (rowsXcolumn) matrices containing mid-term exam marks and end-term exam marks of 100 students. Each row refers to a particular student, while columns refer to marks in English, Social Sciences and Maths. The end-term and mid-term marks of each student in each subject have to be added to get his total score in each subject, to be put in a third matrix (100X3). Parinidhi writes a code (Code A), where the outer loop iterates over the rows, while the inner loop iterates over the columns. Shashi writes a code (Code B), where the outer loop iterates over the columns, while the inner loop iterates over rows. Which of the following is true with regard to their code ignoring any caching or memory storage effects?
Op 1: Code A is faster than Code B
Op 2: Code B is faster than Code A
Op 3: Code A and Code B will run in the same amount of time
Op 4: The comparison between the speed of the codes cannot be made.
Op 5:
Correct Op : 2

Ques54. A code takes the following code steps (equivalently time unit) to execute: 5*n3 + 6*n2 + 1. Which of the following is not true about the time complexity of the program?
Op 1: It has a time complexity of O(n3
)
Op 2: It has a time complexity of O(n4
)
Op 3: It has a time complexity of O(n2
)
Op 4: It has a time complexity of &theta(n3
)
Op 5:
Correct Op : 3

Ques55. We have two programs. We know that the first has a time complexity O(n2
),
while the second has a complexity &omega(n2

). For sufficiently large n, which of the
following cannot be true?
Op 1: Both codes have same complexity
Op 2: The first code has higher time complexity than the second
Op 3: The second code has lower time complexity than the first code.
Op 4: Both codes are the same.
Op 5:
Correct Op : 2

Ques56. The time complexity of code A is &theta(n), while for Code B it is &theta(log(n)). Which of the following is true for sufficiently large n?
Op 1: Both code have the same time complexity
Op 2: Code A has higher time complexity
Op 3: Code B has higher time complexity
Op 4: No comparison can be made between the time complexity of the two codes.
Op 5:
Correct Op : 2

Ques57. Rajini is given an efficient code for summing two nXn matrices and putting the result in a third matrix. She is asked to find it's time complexity. She realizes that the number of iterations required is more than n. What can she claim with regard to the complexity of the code?
Op 1: It is O(n)
Op 2: It is O(n2)
Op 3: It is &theta(n)
Op 4: It is &omega(n)
Op 5:
Correct Op : 4

Ques58. Gautam is given two codes, A and B, to solve a problem, which have complexity &theta(n) and &theta(n2) respectively. His client wants to solve a problem of size k, which Gautam does not know. Which code will Gautam deliver to the client, so that the execution is faster?
Op 1: Code A
Op 2: Code B
Op 3: Gautam cannot determine

Op 4: Both codes have the same execution time, so deliver any.
Op 5:
Correct Op : 3

Ques59. Surbhi is given two codes, A and B, to solve a problem, which have complexity O(n3) and &omega(n4) respectively. Her client wants to solve a problem of size k, which is sufficiently large. Which code will Surbhi deliver to the client, so that the execution is faster?
Op 1: Code A
Op 2: Code B
Op 3: Surbhi cannot determine
Op 4: Both codes have the same execution time, so deliver any.
Op 5:
Correct Op : 1

Ques60. Vibhu is given two codes, A and B, to solve a problem, which have complexity O(n4) and &omega(n3) respectively. Her client wants to solve a problem of size k, which is sufficiently large. Which code will Gautam deliver to the client, so that the execution is faster?
Op 1: Code A
Op 2: Code B
Op 3: Vibhu cannot determine
Op 4: Both codes have the same execution time, so deliver any.
Op 5:
Correct Op : 3

Ques61. Pavithra is given two codes, A and B, to solve a problem, which have complexity &theta(n3) and &omega(n3) respectively. Her client wants to solve a problem of size k, which is sufficiently large. Which code should she deliver to the client in the present scenario?
Op 1: Code A
Op 2: Code B
Op 3: Both codes have the same execution time, so deliver any.
Op 4: None of these
Op 5:
Correct Op : 1

Ques61. Code A has to execute 4*n2 + 64 program statements, while Code B has to execute 32*n program statements for a problem of size n. The time for executing a single program statement is same for all statements. Rajesh was given a problem with a certain size k and he delivered Code A. What could be the possible value of k?
Op 1: 1000
Op 2: 5
Op 3: 10
Op 4: 3
Op 5:
Correct Op : 4

Ques63. Saumya writes a code which has a function which calls itself. Which programming concept is Saumya using?
Op 1: This is bad programming practice and should not be done.
Op 2: Recursion
Op 3: Decision Making
Op 4: Overloading
Op 5:
Correct Op : 2

Ques64. Shrishti writes the code for a function that computes the factorial of the inputted number n.

```
function factorial(n)
{
if(n equals 1)
 return 1
else
-- MISSING STATEMENT --
end
}
```

Fill in the missing statement.
Op 1: return factorial(n-1)
Op 2: return n*factorial(n)
Op 3: return n*(n-1)
Op 4: return n*factorial(n-1)

Op 5:
Correct Op : 4

Ques65. Tanuj writes the code for a function that takes as input n and calculates the sum of first n natural numbers.

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

Fill in ?? in the code.
Op 1: n equals 1
Op 2: n equals 2
Op 3: n >= 1
Op 4: n > 1
Op 5:
Correct Op : 1

Ques66. Saloni writes the code for a function that takes as input n, an even integer and calculates the sum of first n even natural numbers.

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

She then calls the function by the statement, sum(30). How many times will the function sum be called to compute this sum.
Op 1: 1
Op 2: 30
Op 3: 15
Op 4: 16

Op 5:
Correct Op : 3

Ques67. Consider the following function
function calculate(n)
{
if(n equals 5)
 return 5
else
 return (n + calculate(n-5))
end
}
Shishir calls the function by the statement, calculate(20). What value will the function return?
Op 1: 50
Op 2: 200
Op 3: 35
Op 4: 20
Op 5:
Correct Op : 1

Ques68. Ravi is writing a program in C++. C++ uses the 'for' keyword for loops. Due to distraction, Ravi writes 'gor' instead of 'for'. What will this result to?
Op 1: The code will not compile.
Op 2: The code will give an error while in execution
Op 3: The code may work for some inputs and not for others.
Op 4: It will create no problems.
Op 5:
Correct Op : 1

Ques69. What does a compiler do?
Op 1: Converts code from a high level language to a low level language
Op 2: Necessarily converts the code into assembly language
Op 3: Converts code from a low level language to a high level language
Op 4: Necessarily converts the code into machine language
Op 5:
Correct Op : 1

Ques70. A program is compiled by Tarun on his machine. Whether it will run on a different computer will depend upon:
Op 1: Operating system on the computer
Op 2: Hardware configuration of the computer

Op 3: Both operating system and hardware configuration
Op 4: The language of the program
Op 5:
Correct Op : 3

Ques71. Sakshi writes a code in a high-level programming language on a Pentium-III machine, which she wants to execute on a Motorola chip. What of the following will she run on the code?
Op 1: An interpreter
Op 2: A compiler
Op 3: A cross-compiler
Op 4: Linker
Op 5:
Correct Op : 3

Ques72. Shahaana has a 10,000 line code. She is trying to debug it. She knows there is a logical error in the first 25 lines of the code. Which of the following will be an efficient way of debugging:
Op 1: Compile the whole code and step into it line by line
Op 2: Use an interpreter on the first 25 lines.
Op 3: Compile the whole code and run it
Op 4: None of these
Op 5:
Correct Op : 2

Ques73. Farhan writes a code to find the factorial of an inputted number. His code gives correct answer for some inputs and incorrect answers for others. What kind of error does his program have?
Op 1: Syntactical error
Op 2: Run-time Error
Op 3: Logical Error
Op 4: None of these
Op 5:
Correct Op : 3

Ques74. Reshama is debugging a piece of code which takes several iterations of modifying and executing code, while Mohammad has to deliver a product to the customer, which the customer will run multiple times. Reshama wants her debug cycle to take minimum possible time, while Mohammad wants that his products run time is minimum. What tools should Reshama and Mohammad respectively use on their code?
Op 1: Compiler, Interpreter

Op 2: Interpreter, Compiler
Op 3: Compiler, Compiler
Op 4: Interpreter, Interpreter
Op 5:
Correct Op : 2

Ques75. Gautam writes a program to run on a Motorola processor on his Pentium computer. He wants to see how the program will execute on the Motorola processor using his Pentium machine. What tool will he use?
Op 1: Compiler
Op 2: Interpreter
Op 3: Assembler
Op 4: Simulator
Op 5:
Correct Op : 4

Ques76. Consider the following code:

```
function modify(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
}
```

Assume that a and b were passed by value. What will be the output on executing function calculate( )?
Op 1: 11 -5
Op 2: 10 -5
Op 3: 6 -5
Op 4: 5 -5
Op 5:
Correct Op : 4

Ques77. Consider the following code:

```
function modify(b,a)
```

```
{
return a - b
}
function calculate( )
{
integer a = 5, b = 12, c
c = modify(a, b);
print c
}
```

Assume that a and b were passed by reference. What will be the output of the program on executing function calculate( ) ?

Op 1: 7
Op 2: -7
Op 3: Error
Op 4: 8
Op 5:
Correct Op : 1

Ques78. Consider the following code:

```
function modify(y,z)
{
y = y + 1
z = z + 1
return y - z
}
function calculate( )
{
integer a = 12, b = 20, c
c = modify(a, b);
print a
print space
print c
}
```

Assume that a and b were passed by reference. What will be the output of the function calculate( ) ?

Op 1: 12 -8
Op 2: 13 -8
Op 3: 12 8
Op 4: 13 8
Op 5:
Correct Op : 2

Ques79. Afzal writes a piece of code, where a set of three lines occur around 10 times in different parts of the program. What programming concept can he use to shorten his program code length?
Op 1: Use for loops
Op 2: Use functions
Op 3: Use arrays
Op 4: Use classes
Op 5:
Correct Op : 2

Ques80. Geetika writes a piece of code, where a set of eight lines occur around 10 times in different parts of the program (Code A). She passes on the code to Deva. Deva puts the set of eight lines in a function definition and calls them at the 10 points in the program (Code B). Which code will run faster using an interpreter?
Op 1: Code A
Op 2: Code B
Op 3: Code A and Code B will run with the same speed
Op 4: None of these
Op 5:
Correct Op : 1

Ques81. Consider the following code:

```
function modify(a,b)
{
integer c, d = 2
c = a*d + b
return c
}
function calculate( )
{
integer a = 5, b = 20, c
integer d = 10
c = modify(a, b);
c = c + d
print c
}
```

Assume that a and b were passed by value. What will be the output of the function calculate( ) ?
Op 1: 80
Op 2: 40
Op 3: 32
Op 4: 72

Op 5:
Correct Op : 2

Ques82. Consider the following code:

```
function modify(w,u)
{
w = w + 2
u = u - 3
return (w - u)
}
function calculate( )
{
integer a = 10, b = 20, c
c = modify(a, b);
print a
print space
print b
}
```

Assume that a was passed by value and b was passed by reference. What will be the output of the program on executing function calculate( ) ?
Op 1: 12 17
Op 2: 10 17
Op 3: 12 20
Op 4: 10 20
Op 5:
Correct Op : 2

Ques83. Consider the following function:

```
function run( )
{
integer a = 0 // Statement 1
while (a < 5)
{
 integer c = 0 // Statement 2
 c = c + 1 // Statement 3
 a = a + 1
}
print c // Statement 4
}
```

At which statement in this program will the compiler detect an error?
Op 1: Statement 1
Op 2: Statement 2

Op 3: Statement 3
Op 4: Statement 4
Op 5:
Correct Op : 4

Ques85. Which one of the following is the lowest level format to which the computer converts a higher language program before execution?
Op 1: English code
Op 2: Machine Code
Op 3: Assembly Language
Op 4: System Language
Op 5:
Correct Op : 2

Ques86. If you want to write a function that swaps the values of two variables, you must pass them by:
Op 1: Value only
Op 2: Reference only
Op 3: Either A or B
Op 4: Neither A nor B
Op 5:
Correct Op : 2

Ques87. Consider the following code:

```
if (condition 1) {
if (condition 2)
{ // Statement A }
else
 if (condition 3)
 { // Statement B }
 else
 { // Statement C }
else
if (condition 4)
{ // Statement D }
else
{ // Statement E}
}
```

Which of the following conditions will allow execution of statement C?
Op 1: condition1 AND condition3
Op 2: condition1 AND condition4 AND !condition2
Op 3: NOT(condition2) AND NOT(condition3)

Op 4: condition1 AND NOT(condition2) AND NOT(condition3)
Op 5:
Correct Op : 4

Ques88. Consider the following code:

```
if (condition 1) {
if (condition 2)
{ // Statement A }
else
 if (condition 3)
 { // Statement B}
 else
 {// Statement C }
else
if (condition 4)
{// Statement D}
else
{// Statement E}
}
```

Which of the following conditions will allow execution of statement E?
Op 1: condition1 AND condition3
Op 2: NOT(condition1) AND condition2 AND NOT(condition4)
Op 3: NOT(condition2) AND NOT(condition3)
Op 4: condition1 AND condition4 AND NOT(condition2) AND NOT(condition3)
Op 5:
Correct Op : 2

Ques89. Consider the following code:

```
if (condition 1) {
if (condition 2)
{ // Statement A }
else
 if (condition 3)
 { // Statement B}
 else
 {// Statement C }
else
if (condition 4)
{// Statement D}
else
{// Statement E}
}
```

Which of the following condition will allow execution of statement A?
Op 1: NOT(condition2) AND NOT(condition3)
Op 2: condition1 AND condition4 AND NOT(condition2) AND NOT(condition3)
Op 3: condition1 AND condition2 AND condition4
Op 4: NOT(condition1) AND condition2 AND NOT(condition4)
Op 5:
Correct Op : 3

Ques90. What does the following function do?
function operation (int a, int b)
{
if (a < b)
{ return operation(b, a) }
else
{ return a }
}
Op 1: Returns the max of (a,b)
Op 2: Returns the min of (a,b)
Op 3: Loops forever
Op 4: Always returns the second parameter
Op 5:
Correct Op : 1

Ques91. What does the following function do?
function operation (int a, int b)
{
if (a > b)
{ return operation(b, a) }
else
{ return a; }
}
Op 1: Always returns the first parameter
Op 2: Returns the min of (a,b)
Op 3: Returns the max of (a,b)
Op 4: Loops forever
Op 5:
Correct Op : 2

Ques92. function g(int n)
{
if (n > 0) return 1;
else return -1;

```
}
function f(int a, int b)
{
if (a > b) return g(b-a);
if (a < b) return g(a-b);
return 0;
}
```

If f(a,b) is called, what is returned?
Op 1: Always -1
Op 2: 1 if a > b, -1 if a < b, 0 otherwise
Op 3: -1 if a > b, 1 if a < b, 0 otherwise
Op 4: 0 if a equals b, -1 otherwise
Op 5:
Correct Op : 4

Ques93.
```
function g(int n)
{
if (n > 0) return 1;
else return -1;
}
function f(int a, int b)
{
if (a > b) return g(a-b);
if (a < b) return g(b-a);
return 0;
}
```

If f(a,b) is called, what is returned?
Op 1: 1 if a > b, -1 if a < b, 0 otherwise
Op 2: Always +1
Op 3: 0 if a equals b, +1 otherwise
Op 4: -1 if a > b, 1 if a < b, 0 otherwise
Op 5:
Correct Op : 3

Ques94.
```
function g(int n)
{
if (n > 0) return 1;
else return -1;
}
function f(int a, int b)
{
if (a > b) return g(a-b);
```

if (a < b) return g(-b+a);
return 0;
}
If f(a,b) is called, what is returned?
Op 1: Always +1
Op 2: 1 if a > b, -1 if a < b, 0 otherwise
Op 3: -1 if a > b, 1 if a < b, 0 otherwise
Op 4: 0 if a equals b, -1 otherwise
Op 5:
Correct Op : 2

Ques95. function g(int n)
{
if (n > 0) return 1;
else return -1;
}
function f(int a, int b)
{
if (a > b) return g(b-a);
if (a < b) return g(-a+b);
return 0;
}
If f(a,b) is called, what is returned?
Op 1: Always +1
Op 2: -1 if a > b, 1 if a < b, 0 otherwise
Op 3: 1 if a > b, -1 if a < b, 0 otherwise
Op 4: 0 if a equals b, -1 otherwise
Op 5:
Correct Op : 2

Ques96. Consider the following code:
for i= m to n increment 2
{ print "Hello!" }
Assuming m < n and exactly one of (m,n) is even, how many times will Hello be printed?
Op 1: (n - m + 1)/2
Op 2: 1 + (n - m)/2
Op 3: 1 + (n - m)/2 if m is even, (n - m + 1)/2 if m is odd
Op 4: (n - m + 1)/2 if m is even, 1 + (n - m)/2 if m is odd
Op 5:
Correct Op : 1

Ques97. Consider the following code:
for i= m to n increment 2
{ print "Hello!" }
Assuming m < n and (m,n) are either both even or both odd, How many times will Hello be printed?
Op 1: (n - m + 1)/2
Op 2: 1 + (n - m)/2
Op 3: 1 + (n - m)/2 if m is even, (n - m + 1)/2 if m is odd
Op 4: (n - m + 1)/2 if m is even, 1 + (n - m)/2 if m is odd
Op 5:
Correct Op : 2

Ques98. Assuming n > 2, What value does the following function compute for odd n?
function f (int n)
{
if (n equals 1) { return 1 }
if (n equals 2) { return f(n-1) + n/2 }
return f(n-2) + n;
}
Op 1: 1 + 2 + 3 + 4 + ... + n
Op 2: 1 + 3 + 5 + 7 + ... + n
Op 3: n/2 + (1 + 3 + 5 + 7 + ... + n)
Op 4: 1 + (1 + 3 + 5 + 7 + ... + n)
Op 5:
Correct Op : 2

Ques99. Assuming n > 2, What value does the following function compute for even n?
int f (int n)
{
if (n equals 1) { return 1 }
if (n equals 2) { return f(n-1) + n/2 }
return f(n-2) + n
}
Op 1: 1 + 2 + 3 + 4 + ... + n
Op 2: 1 + (2 + 4 + 6 + 8 + ... + n)
Op 3: 1 + n/2 + (4 + 6 + 8 + ... + n)
Op 4: 2 + 4 + 6 + 8 + ... + n
Op 5:
Correct Op : 4

Ques100. The for loop is equivalent to a while loop when
Op 1: There is no initialization expression

Op 2: There is no increment expression
Op 3: A and B combined are true
Op 4: It is never equivalent
Op 5:
Correct Op : 3

Ques101. 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?
Op 1: a < 1.0
Op 2: a < sqrt(10)
Op 3: a > sqrt(10)
Op 4: a = 0
Op 5:
Correct Op : 1

Ques102. int area(double radius)
{
return PI*radius*radius;
}
Which of the following is always true about the function area?
Op 1: It returns the area of a circle within the limits of double precision.
Op 2: It returns the area of a circle within the limits of the constant PI.
Op 3: It returns the area of a circle within the limits of precision of double, or the constant PI, whichever is lower.
Op 4: None of the above.
Op 5:
Correct Op : 4

Ques103. What does this function compute for positive n?
function f(int n)
{
if (n equals 1)
{ return 1 }
else
{ return f(n-1)/f(n-1) + n }
}
Op 1: 1 + n
Op 2: 1 + 2 + 3 + ... + n
Op 3: 1 + n, if n > 1, 1 otherwise
Op 4: None of the above

Op 5:
Correct Op : 3

Ques104. Which of these is not a data type?
Op 1: integer
Op 2: character
Op 3: boolean
Op 4: array
Op 5:
Correct Op : 4

Ques105. The construct "if (condition) then A else B" is for which of the following purposes?
Op 1: Decision-Making
Op 2: Iteration
Op 3: Recursion
Op 4: Object Oriented Programming
Op 5:
Correct Op : 1

Ques106. In a sequential programming language, code statements are executed in which order?
Op 1: All are executed simultaneously
Op 2: From top to bottom
Op 3: From bottom to top
Op 4: None of these
Op 5:
Correct Op : 2

Ques107. A for-loop is used for which of the following purposes?
Op 1: Decision-Making
Op 2: Iteration
Op 3: Recursion
Op 4: None of these
Op 5:
Correct Op : 2

Ques108. There are two loops which are nested. This implies which one of the following?
Op 1: Two loop, one after the other
Op 2: Two loops, one inside the others
Op 3: One loop with two different iteration counts
Op 4: Two loops with the same iteration count

Op 5:
Correct Op : 2

Ques109. How will 47 be stored as an unsigned 8-bit binary number?
Op 1: 10111101
Op 2: 00101111
Op 3: 10111000
Op 4: 00101101
Op 5:
Correct Op : 2

Ques110. An integer X is saved as an unsigned 8-bit number, 00001011.What is X?
Op 1: 22
Op 2: 11
Op 3: 10
Op 4: None of these
Op 5:
Correct Op : 2

Ques111. A variable cannot be used...
Op 1: Before it is declared
Op 2: After it is declared
Op 3: In the function it is declared in
Op 4: Can always be used
Op 5:
Correct Op : 1

Ques112. What is implied by the argument of a function?
Op 1: The variables passed to it when it is called
Op 2: The value it returns on execution
Op 3: The execution code inside it
Op 4: Its return type
Op 5:
Correct Op : 1

Ques113. Which of the following is true about comments?
Op 1: They are executed only once.
Op 2: They are not executed
Op 3: A good program does not contain them
Op 4: They increase program execution time.
Op 5:
Correct Op : 2

Ques114. Neelam wants to share her code with a colleague, who may modify it. Thus she wants to include the date of the program creation, the author and other information with the program. What component should she use?
Op 1: Header files
Op 2: Iteration
Op 3: Comments
Op 4: Preprocessor directive
Op 5:
Correct Op : 3

Ques115. Shashi writes a program in C++ and passes it on to Pankaj. Pankaj does some indentation in some statements of the code. What will this lead to?
Op 1: Faster Execution
Op 2: Lower memory requirement
Op 3: Correction of errors
Op 4: Better readability
Op 5:
Correct Op : 4

Ques116. Zenab and Shashi independently write a program to find the the mass of one mole of water, which includes mass of hydrogen and oxygen. Zenab defines the variables:
integer hydrogen, oxygen, water // Code A
while Shashi defines the three quantities as:
integer a, b, c // Code B
Which is a better programming practice and why?
Op 1: Code B is better because variable names are shorter
Op 2: Code A is better because the variable names are understandable and nonconfusing
Op 3: Code A will run correctly, while Code B will give an error.
Op 4: Code B will run correctly, while Code A will give an error.
Op 5:
Correct Op : 2

Ques117. For solving a problem, which of these is the first step in developing a working program for it?
Op 1: Writing the program in the programming language
Op 2: Writing a step-by-step algorithm to solve the problem.
Op 3: Compiling the libraries required.
Op 4: Code debugging
Op 5:
Correct Op : 2

Ques118. A robust program has which one of the following features?
Op 1: It runs correctly on some inputs
Op 2: It is robust to hardware damage
Op 3: It can handle incorrect input data or data types.
Op 4: None of these
Op 5:
Correct Op : 3

Ques119. Tarun wants to write a code to divide two numbers. He wants to warn the user and terminate the program if he or she enters 0 as the divisor. Which programming construct can he use to do this?
Op 1: Iteration
Op 2: Decision-making
Op 3: Recursion
Op 4: None of these
Op 5:
Correct Op : 2

Ques120. To solve a problem, it is broken in to a sequence of smaller sub-problems, till a stage that the sub-problem can be easily solved. What is this design approach called?
Op 1: Top-down Approach
Op 2: Bottom-Up Approach
Op 3: Procedural Programming
Op 4: None of these
Op 5:
Correct Op : 1

Ques121. The time complexity of linear search algorithm over an array of n elements is
Op 1: O (log2 n)
Op 2: O (n)
Op 3: O (n log2 n)
Op 4: O (n2
)
Op 5:
Correct Op : 2

Ques122. Rajesh implements queue as a singly-linked linked list. The queue has n elements. The time complexity to ADD a new element to the queue:
Op 1: O (1)
Op 2: O (log2 n)
Op 3: O (n)

Op 4: O (n log2 n)
Op 5:
Correct Op : 1

Ques123. The time required to insert an element in a stack with linked list implementation is
Op 1: O (1)
Op 2: O (log2 n)
Op 3: O (n)
Op 4: O (n log2 n)
Op 5:
Correct Op : 1

Ques124. In the following sorting procedures, which one will be the slowest for any given array?
Op 1: Quick sort
Op 2: Heap sort
Op 3: Merge Sort
Op 4: Bubble sort
Op 5:
Correct Op : 4

Ques125. Pankaj stores n data elements in a hash table. He is able to get the best efficiency achievable by a hash table. What is the time complexity of accessing any element from this hash table?
Op 1: O(1)
Op 2: O(n2
)
Op 3: O(log n)
Op 4: O(n)
Op 5:
Correct Op : 1

Ques126. 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?
Op 1: Linear Search
Op 2: Binary search
Op 3: Hash Coded Search
Op 4: None of these
Op 5:
Correct Op : 3

Ques127. The order of magnitude of the worst case performance of a hash coded search (over N elements) is
Op 1: N
Op 2: N log2 N
Op 3: log2 N
Op 4: not dependent upon N
Op 5:
Correct Op : 1

Ques128. A sorting algorithm traverses through a list, comparing adjacent elements and switching them under certain conditions. What is this sorting algorithm called?
Op 1: insertion sort
Op 2: heap sort
Op 3: quick sort
Op 4: bubble sort
Op 5:
Correct Op : 4

Ques129. A sorting algorithm iteratively traverses through a list to exchange the first element with any element less than it. It then repeats with a new first element. What is this sorting algorithm called?
Op 1: insertion sort
Op 2: selection sort
Op 3: heap sort
Op 4: quick sort
Op 5:
Correct Op : 2

Ques130. A sort which uses the binary tree concept such that any number in the tree is larger than all the numbers in the subtree below it is called
Op 1: selection sort
Op 2: insertion sort
Op 3: heap sort
Op 4: quick sort
Op 5:
Correct Op : 3

Ques131. The average time required to perform a successful sequential search for an element in an array A(1 : n) is given by
Op 1: (n+1) / 2
Op 2: log2n

Op 3: n(n+1) / 2
Op 4: n2
Op 5:
Correct Op : 1

Ques132. How many comparisons are needed to sort an array of length 5 if a straight selection sort is used and array is already in the opposite order?
Op 1: 1
Op 2: 10
Op 3: 50
Op 4: 20
Op 5:
Correct Op : 2

Ques133. Queues serve a major role in
Op 1: simulation of recursion
Op 2: simulation of arbitrary linked list
Op 3: simulation of limited resource allocation
Op 4: expression evaluation
Op 5:
Correct Op : 3

Ques134. The average search time of hashing with linear probing will be less if the load factor
Op 1: is far less than one
Op 2: equals one
Op 3: is far greater than one
Op 4: none of these
Op 5:
Correct Op : 1

Ques135. Number of vertices of odd degree in a graph is
Op 1: is always even
Op 2: always odd
Op 3: either even or odd
Op 4: always zero
Op 5:
Correct Op : 1

Ques136. The algorithm design technique used in the quick sort algorithm is
Op 1: Dynamic programming
Op 2: Back tracking

Op 3: Divide and conquer
Op 4: Greedy Search
Op 5:
Correct Op : 3

Ques137. Linked lists are not suitable for
Op 1: Insertion sort
Op 2: Binary search
Op 3: Queue implementation
Op 4: None of these
Op 5:
Correct Op : 2

Ques138. A connected graph is the one which
Op 1: Cannot be partitioned without removing an edge
Op 2: Can be partitioned without removing an edge
Op 3: does not contain a cycle
Op 4: Has even number of vertices
Op 5:
Correct Op : 1

Ques140. Stack is useful for implementing
Op 1: radix search
Op 2: breadth first search
Op 3: recursion
Op 4: none of these
Op 5:
Correct Op : 3

Ques141. Which of the following is useful in traversing a given graph by breadth first search?
Op 1: stack
Op 2: set
Op 3: list
Op 4: queue
Op 5:
Correct Op : 4

Ques142. Which of the following is useful in implementing quick sort?
Op 1: stack
Op 2: set
Op 3: list

Op 4: queue
Op 5:
Correct Op : 1

Ques143. Which of the following abstract data types can be used to represent a manyto-many relation?
Op 1: Tree
Op 2: Stack
Op 3: Graph
Op 4: Queue
Op 5:
Correct Op : 3

Ques144. Two lists, A and B are implemented as singly linked link-lists. The address of the first and last node are stored in variables firstA and lastA for list A and firstB and lastB for list B. Given the address of a node is given in the variable node, the element stored in the node can be accessed by the statement node->data and the address to the next node can be accessed by node->next. Pankaj wants to append list B at end of list A. Which of the following statements should he use?
Op 1: lastB -> next = firstA
Op 2: lastA = firstB
Op 3: lastA->next = firstB
Op 4: lastB = firstA
Op 5:
Correct Op : 3

Ques145. Which of the following sorting algorithms yield approximately the same worstcase and average-case running time behaviour in O (n log n)?
Op 1: Bubble sort and Selection sort
Op 2: Heap sort and Merge sort
Op 3: Quick sort and Radix sort
Op 4: Tree sort and Median-of-3 Quick sort
Op 5:
Correct Op : 2

Ques146. A complete binary tree with 5 levels has how many nodes? (Root is Level 1)
Op 1: 15
Op 2: 25
Op 3: 63
Op 4: 31
Op 5:

Correct Op : 4

Ques147. The maximum number of nodes on level I of a binary tree is which of the following? (Root is Level 1)
Op 1: 2l-1
Op 2: 3l-1
Op 3: 2l
Op 4: 2l - 1
Op 5:
Correct Op : 1

Ques148. 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.
Op 1: A [x+1]
Op 2: A [x+2]
Op 3: A [x+2x]
Op 4: All of these.
Op 5:
Correct Op : 1

Ques149. In an implementation of a linked list, each node contains data and address. Which of the following could the address field possibly contain?
Op 1: Address of next node in sequence
Op 2: It's own address
Op 3: Address of last node
Op 4: Address of first node
Op 5:
Correct Op : 1

Ques150. Surbhi wants to implement a particular data structure using a static array. She uses the concept of circular list to implement the data structure, because this allows her to efficiently use all fields of the array. Which data structure is Surbhi implementing?
Op 1: a stack
Op 2: a queue
Op 3: Binary Tree
Op 4: None of these
Op 5:
Correct Op : 2

Ques151. Which of the following is a bad implementation for a queue?
Op 1: Circular List

Op 2: Doubly linked list
Op 3: Singly linked List
Op 4: Linear Static Array
Op 5:
Correct Op : 4

Ques152. Which of the following statements are true about a doubly-linked list?
Op 1: it may be either linear or circular
Op 2: it must contain a header node
Op 3: it will occupy same memory space as that of linear linked list, both having same number of nodes
Op 4: None of these
Op 5:
Correct Op : 1

Ques153. Which of the following data structure may give overflow error, even though the current number of element in it is less than its size ?
Op 1: Queue implemented in a linear array
Op 2: Queue implemented in a circularly connected array
Op 3: Stack implemented in a linear array
Op 4: none of these
Op 5:
Correct Op : 1

Ques154. Number of possible ordered trees with 3 nodes A, B, C is
Op 1: 16
Op 2: 12
Op 3: 13
Op 4: 14
Op 5:
Correct Op : 2

Ques155. The best sorting methods if number of swapping done is the only measure of efficiency is
Op 1: Bubble sort
Op 2: Selection sort
Op 3: Insertion sort
Op 4: Quick sort
Op 5:
Correct Op : 3

Ques156. As part of the maintenance work, you are entrusted with the work of

rearranging the library books in a shelf in proper order, at the end of each day. The ideal choice will be
Op 1: bubble sort
Op 2: insertion sort
Op 3: selection sort
Op 4: heap sort
Op 5:
Correct Op : 2

Ques157. A hash table can store a maximum of 10 records. Currently there are records in locations 1, 3, 4, 7, 8, 9, 10. The probability of a new record going into location 2, with a hash function resolving collisions by linear probing is
Op 1: 0.6
Op 2: 0.1
Op 3: 0.2
Op 4: 0.5
Op 5:
Correct Op : 1

Ques158. A full binary tree with n leaves contains
Op 1: 2n + 1 nodes
Op 2: log2 n nodes
Op 3: 2n - 1 nodes
Op 4: 2n nodes
Op 5:
Correct Op : 3

Ques159. An array contains the following elements in order: 7 6 12 30 18. Insertion sort is used to sort the array in ascending order. How many times will an insertion be made?
Op 1: 2
Op 2: 3
Op 3: 4
Op 4: 5
Op 5:
Correct Op : 1

Ques160. An array of 5 numbers has the following entries in order: 7 4 5 10 8. Prashant uses selection sort to sort this array in descending order. What will the array contain after two iterations of selection sort?
Op 1: 10 8 7 5 4
Op 2: 10 8 5 7 4

Op 3: 8 10 5 7 4
Op 4: None of these
Op 5:
Correct Op : 2

Ques161. Srishti writes a program to find an element in the array A[5] with the following elements in order: 8 30 40 45 70. She runs the program to find a number X. X is found in the first iteration of binary search. What is the value of X?
Op 1: 40
Op 2: 8
Op 3: 70
Op 4: 30
Op 5:
Correct Op : 1

Ques162. The array A has n elements. We want to determine the position of X in the array. We know that X is present in the array A and X can be present at any location in the array with equal probability. How many comparisons will be required on average to find the element X using linear search?
Op 1: n
Op 2: (n+1)/2
Op 3: 2*n
Op 4: n^2
Op 5:
Correct Op : 2

Ques163. A is an empty stack. The following operations are done on it.
PUSH(1)
PUSH(2)
POP
PUSH(5)
PUSH(6)
POP
What will the stack contain after these operations. (Top of the stack is underlined)
Op 1: 5 6
Op 2: 1 5
Op 3: 5 6
Op 4: 1 5
Op 5:
Correct Op : 2

Ques164. A stack is implemented as a linear array A[0...N-1]. Farhan writes the following

functions for pushing an element E in to the stack.

```
function PUSH( top, E, N )
{
if(X)
{
 top= top+1
 A[top] = E
}
else
{
 print "Overflow"
}
return top
}
```

Fill in the condition X

Op 1: top< N

Op 2: top <n-1

Op 3: top > 0

Op 4: top > 1

Op 5:

Correct Op : 2

Ques165. A stack is implemented as a linear array A[0...N-1]. Noor writes the following functions for popping

an element from the stack.

```
function POP( top, N )
{
if(X)
{
 top = top - 1
}
else
{
 print "Underflow"
}
return top
}
```

Fill in the condition X

Op 1: top< N-1

Op 2: top<n

Op 3: top>1

Op 4: top >= 0

Op 5:
Correct Op : 4

Ques166. Q is an empty queue. The following operations are done on it:
ADD 5
ADD 7
ADD 46
DELETE
ADD 13
DELETE
DELETE
ADD 10
What will be the content of Q after these operations. Front is marked by (F) and Rear is marked by (R).
Op 1: 10(R) 13(F)
Op 2: 5(R) 10(F)
Op 3: 13(R) 10(F)
Op 4: 10(R) 5(F)
Op 5:
Correct Op : 1

Ques167. A queue is implemented as a (singly linked) linked-list for easy addition and deletion of elements.
Each node has an element and pointer to another node. Which node will point to empty/no location?
Op 1: Front
Op 2: Rear
Op 3: Both
Op 4: None of these
Op 5:
Correct Op : 2

Ques168. A stack is implemented as a (singly-linked) linked-list, where each node contains data and address of another node. The top node will contain the address of which node?
Op 1: No node. It will be empty
Op 2: The node containing the first element pushed into the stack.
Op 3: The node containing the element which was pushed just before the top element.
Op 4: None of these
Op 5:
Correct Op : 3

Ques169. 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?
Op 1: 6
Op 2: 7
Op 3: 10
Op 4: None of these
Op 5:
Correct Op : 2

Ques170. A queue is implemented as a (singly linked) linked-list. Each node has an element and pointer to
another node. Rear and Front contain the addresses of the rear and front node respectively. If the
condition (rear isequal front) is true and neither is NULL, what do we infer about the linked list?
Op 1: It has no elements
Op 2: It has one element
Op 3: There is an error
Op 4: None of these
Op 5:
Correct Op : 2

Ques171. Jaswinder has a book of tickets and wants to store ticket numbers in a data structure. New tickets
are added to the end of the booklet. Ticket at the top of the stack is issued to the customer. Which data
structure should Jaswinder use to represent the ticket booklet?
Op 1: Queue
Op 2: Stack
Op 3: Array
Op 4: Graph
Op 5:
Correct Op : 1
</n
</n-1

SET 2

1. Null function is also known as

a. Anonymous Function

b. Generic Function

c. Void Function

d. Null operator

Ans.D

2. There are two loops which are nested. This implies which of the following

a. Two loops, one after the other

b. Two loops, one inside the other

c. One loop two different iteration counts

d. Two loops with same iteration count

Ans.B

3. Shravanti writes the following program.

```
integer i=0,j
        while( i < 2  )
        {
                j = 0;
                while ( j <= 3*i )
                {
                        print j
                        print blank space
```

```
                    j = j + 3
                }
                print end-of-line //takes the cursor to the next line
                i = i + 1
            }
```

What will be the output of the program?

a. 0
0 3

b. 0 3
0 3 6

c. 0
0 3 6
0 3 6 9

d. 0 3 6
0 3 6 9
0 3 6 9 12

Ans. C

4. What is the term used to describe the situation,when a function in the base class is redefined in inherited class?

a. Inheritance b. Overriding c. Overloading d. Encapsulation

Ans.B

5. Consider the given statements regarding Arrays-

1.Arrays provide a linear medium to store data.

2.Arrays provide a non indexed structure.

3.All the elements in Array depend on the location of the other elements of the Array.

Which of the above statements is/are true?

a. Only 1 b. Both 1 and 2 c. Both 1 and 3 d. 1, 2 and 3

Ans.D

6. Consider a binary tree implementation. The root address is stored in variable root. Given the address of a node is variable node, its value, right and root could node address can be accessed using the following statements respectively node-> value ,node -> right, node-> left. Srikanth writes the following function to do a preorder traversal of the tree.

```
function preordertraverse(n0de)
{
                print node -> value
                if(Conditon X)
                {
preordertraverse(node ->left)
}
                if(Condition Y)
                {
preordertraverse(node ->right)
}
                return
        }
```

What is the Condition X and Condition Y ?

a. Condition X: node -> left is not equal null

b. Condition X: node -> right is not equal null,Condition Y:node -> right is not equal null,Condition Y:node -> left is not equal null

c. Condition X: node -> left is equal null

d. Condition X: node -> right is equal null, Condition Y:node -> right is equal null, Condition Y:node -> left is equal null.

Ans.A

7. In breadth-first search,which of the following options is true?

a. Beginning from a node,first all its adjacent nodes are traversed.

b. Beginning from a node,each adjacent node is fully explored before

c. Traversing the next adjacent node.

d. Beginning from a node , nodes are traversed in cyclic order.

e. None of these.

Ans.A

8. Sruti is making a questionnaire of True-False question. She wants to define a data-type which stores the response of the candidate for the question. What is the most suited data type for this purpose?

a. Integer B. Boolean c. float d. character

Ans.B

9. Which of these is not a data type?

a. Integer B. character C. Boolean D. array

Ans.D

10. A full binary tree with n leaves contains

a. 2n+1 nodes b. log2n nodes C. 2n-1 nodes D. 2n nodes

Ans.A

11. In an implementation of a linked list, each node contains data and address. Which of the following could the address field possibly contain?

A. Address of next node in sequence B. It's own address

C. Address of the last node D. Address of the first node

Ans. A

12. Parthiv has included several classes and their subjects in his project. Now he wants to use something that will hold all these objects (of different classes). Which of the following options provides him with the best iterative?

A. Store them in database B. Final class C. Generic class D. Anonymous class

Ans.C

13. Shristhi writes the code for a function that computes the factorial of the inputted number *n*.

function factorial(n)

```
{
        if( n equals 1)
                return 1
        else
                - - MISSING STATEMENT - -
        end
}
```

Fill the missing statement.

a. return factorial(n-1) B. return n*factorial(n) C. return n*(n-1) D. return n*factorial(n-1)

Ans.D

14. Shasi wants to make a program to print the sum of the first 10 multiples of 5. She writes the following program, where statement 5 is missing.

```
integer i=0
integer sum=0
while ( i <= 50)
{
        sum =sum+1
        - - MISSING STATEMENT - -
}
print sum
```

Which of the following options will you use for statement 5?

A. i = 5 B. i = 5 *I C. i = i + 1 D. i = i + 5

Ans.D

15. Consider the following code:

```
if(condition 1)
{
        if(condition 2)
        {
// Statement A
}
         Elseif (condition 3)
                {
//Statement B
}
        else
                {
 // Statement C
}
        else if (condition 4)
                {
 //Statement D
}
        else
{
```

//Statement E

}

}

Which of the following conditions will allow execution of statement C?

A. condition1 AND condition 3

B. condition1 AND condition4 AND NOT (condition2)

C. NOT (condition2) AND NOT (condition3)

D. condition1 AND NOT(condition2) AND NOT(condition3)

Ans.D

16.A full binary tree with *n* non-leaf nodes contains

A. (log n) nodes B. n + 1 nodes C. 2n+1 nodes D. 2n nodes

Ans. C

17. Ravi is writing a program in C++. C++ uses the *'for'* keyword for loops. Due to distraction Ravi writes *'gor' instead* of *'for'*. What will this result to?

A. The code will not compile

B. The code will give an error while in execution

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

D. It will create no problems.

Ans.A

18. Aina wants to use a sorting technique to sort a list of numbers such that the running time of the sorting technique that she uses won't affected by pre-order of the elements. Which of the following sorting techniques should she use?

A. Merge Sort B. Bubble Sort C. Insertion Sort D. Selection Sort

Ans. Not known please write into Comments and will be added here for students reference.

19. While calculating time complexity of an algorithm, the designer concerns himself/herself primarily with the run time and not the compile time. Why?

A. Run time is always more than compile time. B. Compile time is always more than 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.

Ans.D

20. Pankaj and Mythili were both asked to write the code to evaluate the following expression.

$a-b + c/(a-b) + (a-b)^2$

1. Pankaj writes the following code statements (Code A)

```
print (a-b) + c/(a-b) + (a-b) * (a-b)
```

2. Mythili writes the following code statements (Code B)

```
d = (a-b)
print d + c/d + d*d
```

If the time taken to load in a variable, for addition, multiplication or division between two operands is same , which of the following is true?

A. Code A uses lesser memory and is slower than Code B.

B. Code A uses lesser memory and is faster than Code B.

C. Code A uses more memory and is faster than Code B.

D. Code A uses more memory and is slower than Code B.

Ans.A

21. Which of the following sorting algorithm yield approximately the same worst-case and average-case running time behaviour in O (n log n)?

A. Bubble sort and Selection sort

B. Heap sort and Merge sort

C. Quick sort and Radix sort

D. Tree sort and Median-of-3 Quick sort

Ans. B

22. Sujan writes a sorting algorithm. The algorithm takes different amount of time to sort two different lists of equal size. What is the possible difference between the two lists?

A. All numbers in one more list are more than 100, while in other are less than 100.

B. The ordering of numbers with respect to magnitude in two lists has different properties.

C. One list has all negative numbers, while the other has all positive numbers.

D. One list contains 0 as element, while the other does not.

Ans. B

24. Mary is making a database of animals in a zoo and their properties.The possible animals are dog,lion and zebra.Each one has as attribute is Herbivorous,colour and isNocturnal.She uses the object-oriented programming paradigm for this.How will she conceptualise the system?

A. Class: Animal; objects: dog, lion and zebra; data members : isHerbivorous, colour and is Nocturnal

B. Class : Animal; objects : isHerbivorous, colour and isNocturnal; data members : dog, lion and zebra

C. Classes: dog, lion and zebra: objects: Animal; data members: isHerbivorous, colour and is Nocturnal

D. None of these

Ans. A

25. What is implied by the argument of a function?

A. Variables passed to it when it is called

B. The value is returns on execution

C. The execution code inside it

D. Its return type

Ans. A

26. Tanuj writes the code for a function that takes as input n and calculates the sum of first n natural numbers.

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

Fill in?? in the code.

A. n equals 1

B. n equals 2

C. n>=1

D. n>1

Ans. A

27.

```
integer i,k,j,n==5
for i=n to 1 decrement 1
{
   for j=n to i+1 decrement 1
        {
Print blankspace
        }
        for k=1 to ((2*i)-1)increment 1
        {
print "*"
        }
        print  end-of-line //takes the cursor to the nextline
}
```

What will be the output when the given code is executed?

A.
```
*****
****
***
**
*
```

B.
```
*****
****
***
**
*
```

C.
```
*****
****
*****
****
*****
```

D.
```
*
**
***
****
*****
```

Ans .C

28. Afzal writes a piece of code, where a set of three lines occur around 10 times in different parts of the program. What programming concept can he use to shorten his program code length?

A. Use for loops

B. Use functions

C. Use array

D. Use classes

Ans. B

29. Which of the following statements is true regarding the sorting and searching algorithms?

A. Linear searching is faster than the most efficient sorting algorithm

B. Linear searching is slower than the most efficient sorting algorithm

C. Linear searching and the most efficient sorting algorithm take up almost same time

D. Their complexities cannot be compared

Ans. B

30. Stack is used for implementing

A. Radix search B. Breadth first search C. Recursion D. None of these

Ans. C

31. Consider the following:

Class rocket

{

```
Private:
        integer height,weight
        public: //statement 1
        function input(int a,int b)
        {
height=a;
weight=b;
        }
}
function main()
{
rocket rocket 1,rocket2
}
```

What can we infer from this code?

Choose the correct answer. A pseudo-code which is similar to that of c++ and self-explanatory. An accessible member function or data member for an object are accessed by the statement object name, function name or object name data member name respectively.

A. rocket is a class with rocket 1 and rocket2 as its objects.height and weight are attributes of a rocket.

B. rocket is a class with rocket1 and rocket2 as its attributes.height and weight are objects of the class rocket.

C. rocket is a class with rocket1,rocket2,height and weight as its attributes

D. rocket is a class with rocket1, rocket2, height, weight as its objects.

Ans- C

32. Vijay wants to print the following pattern on the screen:

1

1 2

1 2 3

He writes the following program:

```
integer i=1 //statement1
while(i<=3)
{
int  j //statement2
while(j<=i) //statement3
{
print j
print blank space
j=j+1 //ststement4
}
print end-of-line //takes the cursor to the nextline
i=i+1
}
```

Choose the correct answer:

A. Statement 1 B. Statement 2 C. Statement 3 D. Statement 4 E. Program does not have error

Ans - E

33. In an implementation of a linked list, each node contains data and address. Which of the following could the address field possibly contain?

A. Address of next node in sequence B. It's own address C. Address of last node D. Address of first node

Ans- A

34. A sort, which uses the binary tree concept such that any number in the tree is larger than all the numbers in the sub tree below it, is called

A. Selection sort

B. Insertion sort

C. Heap Sort

D. Quick sort

Ans - C

35. A Queue is implemented as a (singly linked)linked-list. Each node has an element and pointer to another node. Rear and Front contain the addresses of the rear and front node respectively. If the condition (rear is equal front) is true and neither is Null, what do we infer about the linked list?

A. It has no elements B. It has one element C. There is an error D. None of these

Ans - B

36. Which of these is not a data type?

A. Integer B. Character C. Boolean D. array

Ans - D

37. A is an empty stack .The following operations are done on it.

PUSH(1)

PUSH(2)

POP

PUSH(5)

PUSH(6)

POP

What will the stack contain after these operations?(top of the stack is underlined)

A. 5 6

B. 1 5

C. 5 6

D. 1 5

Ans- B

38. A sorting algorithm traverses through a list, comparing adjacent elements and switching them under certain conditions. What is this sorting algorithm called?

A. Insertion sort B. Heap sort C. Quick sort D. Bubble sort

Ans-Bubble sort

39. What is the space complexity of a program?

A. Amount of hard-disk space required to store the program

B. Amount of hard-disk space required to compile the program

C. Amount of memory required by the program to run

D. Amount of memory required for the program to compile

Ans. C

40. Which of the following data types does not belong to the category of abstract data types?

A. Hash table B. Set C. Object D. Stack

Ans Object

41. A data type is stored as an 6 bit signed integer. Which of the following options cannot be represented by this data type?

Option 1 -12

Option 2 0

Option 3 32

Option 4 18

Ans -12

42. Shahaana has a 10,000 line code. She is trying to debug it. She knows there is a logical error in the first 25 lines of the code. Which of the following options will be an efficient way of debugging?

Option 1 Compile the whole code and step into it line by line

Option 2 Use an interpreter on the first 25 lines

Option 3 Compile the whole code and run it

Option 4 None of these

Ans B

43. Which of the following sorting algorithms yield approximately the same worst-case and average-case running time behaviour in O (n log n)?

A. Bubble sort and Selection sort

B. Heap sort and Merge sort

C. Quick sort and Radix sort

D. Tree sort and Median-of-3 Quick sort

Ans. B

44. Zenab and Shashi independently write a program to find the mass of one mole of water, which includes mass of hydrogen and oxygen. Zenab defines the variables:

integer hydrogen, oxygen, water //code A

while Shashi defines the three quantities as:

integer a,b,c //code B

Which is a better programming practice and why?

A. Code B is better because variable names are shorter

B. Code A is better because the variable names are understandable and non-confusing

C. Code A will run correctly, while code B will give an error.

D. Code B will run correctly, while code A will give an error.

Ans. B

45. Srishti writes a program to find an element in the array A[5] with the following elements in order: 8 30 40 45 70. She runs the program to find a number X. Xis found in the first iteration of binary search. What is the value of X? Choose the correct answer

A. 40 B. 8 C. 70 D. 30

Ans. A

46. Consider the following pseudo-code

```
Class rocket
{
Private
Integer height, weight
public:   //Statement 1
function input (int a, intb)
{
height =a;
weight =b;
}
}
function main()
{
Rocket rocket1, rocket2
}
```

Choose the correct answer. A pseudo-code which is similar to that of C+ and self-explanatory. An accessible member function or data member for object are accessed by the statement object name.function name or object name.data membername respectively.

A. Rocket is a class with rocket1 and rocket2 as its objects. Height and weight are attributes of a rocket.

B. Rocket is a class with rocket1 and rocket2 as its attributes. Height and weight are objects of the class rocket.

C. Rocket is a class with rocket1, rocket2, height and weight as its attributes.

D. Rocket is a class with rocket1, rocket2, height and weight as its objects.

Ans A

47. There are two loops which are nested. This implies which one of the following? Choose the correct answer?

A. Two loops, one after the other B. Two one inside the other

C. One loop with two different iteration counts D. Two loops with one iteration counts

Ans. B

48. Saloni writes the code for a function that takes as input n, an even integer and calculates the sum of 1st n natural numbers

function sum (n)

{

if(n equals 2)

return 2

else

return (n+ sum(n-1))

}

She then calls the function by the statement, sum(30). How many times will the function sum be called to compute this sum? Choose the correct answer?

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

Ans B

49. A derived class may inherit from the base class which of the following? (Consider assumptions as in c++) Choose the correct answer?

A. Data members B. Member functions

C. Constructors and destructors D. Both data members and member functions

Ans. D

50. Shalini wants to programme to print the largest number out of 3 inputted numbers. She writes the following programme

Int number 1, number 2, number 3, temp;

Input number 1, number 2, number 3;

If (number 1 > number 2)

Temp = number 1

Else

Temp= number 2

End if

If (??) // statement 1

Temp = number 3

End if

Print temp

Fill in the ?? in statement 1 ? Choose the correct answer?

A. Number 3> number 2 B. Number 3> temp C. Number 3< temp D. Number 3> number 1

Ans B

51. How many pointers will have to be changed when a new node is to be added in a linear linked list in the middle?

A. 0 B. 1 C. 2 D. All the pointers will be changed

Ans B

52. A variable cannot be used? Choose the correct answer

A. Before it is declared B. After it is declared C. In the function it is declared in D. Can always be used

Ans A

53. In which area of a class are data and function directly accessible outside the class? Choose the correct answer

A. Public B. Private C. Protected D. None

Ans A

54. Which of the following options is true regarding inheritance in Object Oriented Programming ? Choose the correct answer?

A. There is reduced interaction with the hardware

B. A class may are may not have any object

C. Two are more functions can have the same name and number and type of arguments in a program

D. Class- object relation can be changed at run time

E. All of the above

Ans E

55. A sort , which uses the binary tree concepts such that any number in the tree is a larger than all the numbers in the sub tree below it, is called? Choose the correct answer?

A. Selection sort B. Insertion sort C. Heap sort D. Quick sort

Ans. C

56. 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. Selection search C. Hash coded search D. Binary search E. None of this

Ans. C

57. A complete binary tree with five levels has how many nodes? (root is level 1) Choose the correct answer?

A. 15 B. 25 C. 63 D. 31

Ans C

58. Which of the following abstract data types can be used to represent many – to- many relations? Choose the correct answer?

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

Ans A

59. Pragya sells footballs. She has a large container to store footballs which is closed from below. Footballs are piled one on top of the other in the box. When new balls are supplied, Pragya puts the balls in the box from the top. When a customer buys a ball, she delivers the ball at the top of the pile to the customer. Each ball has a code. She wants to store the ball codes in the data structure to keep track of her inventory. What data structure should she use? Choose the correct answer?

A. Queue B. Stack C. Array D. Graph

Ans B

60. 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

Ans. C

61. Sorting is not possible by using which of the following method? Choose the correct answer ?

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

Ans D

62. For the given array, find the arrangement of the elements after 3rd pass of selection sort. Assume that the array is being sorted in ascending order list ; 33,22, 11, 77, 66, 88, 55

A. 22, 11, 33, 66, 77, 55, 88

B. 11, 22, 33, 55, 66, 77, 88

C. 11, 22, 33, 55, 66, 88, 77

D. 11, 22, 33, 77, 66, 88, 55

63. For solving a problem, which of these in the 1st step in developing a working programme for it? Choose the correct answer?

A. Writing the program in the programming language the problem

B. Writing the step by step algorithm to solve

C. Compiling the libraries required

D. Code debugging

Ans B

64. What is space complexity of a program? Choose the correct answer ?

A. Amount of hard- disk space required to store the program

B. Amount of hard- disk space required to compile the program

C. Amount of memory required by program to run

D. Amount of memory required for the program to compile

Ans C

65.Zenab and Shashi independently write a program to find the mass of one mole of water, which includes mass of hydrogen and oxygen. Zenab defines the variables:

Integer hydrogen, oxygen, water// code A

While shashi defines the 3 quantities as:

Integer a, b, c // code B

Which is the better programming practice and why? Choose the correct answer?

A. Code B is better because variable names are shorter

B. Code A is better because the variable names are understandable and non-confusing

C. Code A will run correctly, while code B will give an error

D. Code B will run correctly while code A gives an error

Ans B

66. 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

Ans B

67. What will be the output of the following pseudo-code statements?

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

Ans D

68. Function MyDisplay(string Mystr) //statement 1

{

Print “Hello!”

Print Mystr

```
                Return 1  //statement 2
        }
function main()  //statement 3
        {
        String str=”Mickey”
        MyDisplay(str)  //statement 4
        }
```

Consider the given code to print a name on the screen. Which statement will generate an error?

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

E. This code will run without any error

Ans A

69. What is implied by the argument of a function?

A. The variables passed to it when it is called B. The value it returns on execution

C. The execution code inside it D. Its return type

Ans A

70. Consider the following pseudo-code

```
Class rocket
{
  private:
        Integer height,weight
```

```
  public:  ///statement 1
function input(int a, int b)
        {
height = a;
weight = b;
        }
}
function main() {
        Rocket rocket 1,rocket 2 ;
 }
```

What can we infer from this code?

A. Rocket is a class with rocket 1 and rocket 2 as its objects. Height and weight are attributes of a rocket.

B. Rocket is a class with rocket 1 and rocket 2 as its attributes .height and weight are objects of the class rocket.

C. Rocket is a class with rocket 1, rocket 2, height and weight as its attributes.

D. Rocket is a class with rocket1, rocket 2, height and weight as its objects.

Ans A

71. Afzal writes a piece of code, where a set of three lines occur around 10 times in different parts of the program. What programming concept can he use to shorten his program code length?

A. use for loops B. use functions C. use arrays D. use classes

Ans B

73. Shravanthi writes the following program:

```
Integer i =0, j
while(I<2)  {
        j=0;
        while(j<=3*I )  {
            Print j
                Print blank space
               J=j+3
        }
        Print end-of-line //takes the cursor to the next line
        i=i+1
}
```

What will be the output of the program?

A. 0
0 3

B. 0 3
0 3 6

C. 0
0 3 6
0 3 6 9

D. 0 3 6
0 3 6 9
0 3 6 9 12

74. A destructor may be invoked in which of the following situations?

A. when the object is created

B. when the object is assigned value 0

C. only at the end of the code

D. when the scope of the object is over

Ans D

75. 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

Ans D

76. Integer a=40, b=35, c=20, d=10. Comment about the output of the following two statements:

Print a*b/c-d

Print a*b/(c-d)

Choose the correct answer? Assume the following prescedence (high to low).operates in the same row have the same precedence: (.) */ + - AND OR. For operates with equal precedence is from left-to-right in expression.

A. differ by 80 B. same C. differ by 50 D. differ by 160

Ans A

77. Stack is useful for implementing.

A. Radix search B. Breadth first search C. Recursion D. None of these

Ans C

78. 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

Ans C

79. A queue is implemented as a (single linked) linked-list. Each node has an element and pointer to another node. Rear and Front contain addresses of the rear and front node respectively. If the condition (rear is equal front) is true and neither is null, what do we infer about the linked list?

A. It has no elements B. It has one element C. There is an error D. None of these

Ans B

80. Which of the following options describes a tree?

A. An unconnected graph B. A connected graph C. A connected acyclic graph D. A complete graph

Ans C

81. A full binary tree with n non-leaf nodes contains.

A. (log n) nodes B. n+1 nodes C. 2n+1 nodes D. 2n nodes

Ans C

82. 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 these

Ans C

83. While calculating time complexity of an algorithm, the designer concerns himself/herself primarily with the run time and not the compile time why?

A. Runtime is always more than compile time

B. Compile time is always more than run time

C. Compile time is a function of run time

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

Ans D

84. Shahana has a 10,000 line code. She is trying to debug it. She knows there is a logical error in the first 25 lines of the code. Which of the following options will be an efficient way of debugging?

A. Compile the whole code and step into it line by line

B. Use an interpreter on the first 25 lines

C. Compile the whole code and run it

D. None of these

Ans B

85. 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

86. Sorting is not possible by using which of the following methods?

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

Ans D

87. 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

Ans D

88. In an implementation of a linked list, each node contains data and address. Which of the following could the address field possibly contain? Choose the correct answer?

A. Address of next node in sequence B. Its own address C. Address of last node D. Address of first node

Ans A

89. A variable cannot be used. Choose the correct answer

A. Before it is declared B. After it is declared C. In the function it is declared in D. Can always be used

Ans A

90. Shashi writes a program in c++ and passes it on to pankaj; pankaj does some indentation in some statements of the code. What will this lead to? Choose the correct answer?

A. Faster execution B. Lower memory requirement C. Correction of errors D. Better readability

Ans D

91. Choose the correct answer?

Question: Consider the given declarations

Integer (*arr1)[10]

Integer *arr2[10]

Which of the following statements is true regarding the above?

A. Arr1 is pointer to an array of integers B. Arr2 is array of integer pointers

C. Arr1 and arr2 both are pointers to array of integers D. Arr1 and arr2 are arrays of integer pointers

E. Arr1 is array of integer pointers F. Arr2 is pointer to an array of integers

92. Himanshu wants to write a program to print the larger of the two inputted number. He writes the Following code:

```
Int number1, number2
Input number1, number2
If(??)  //statement 1
Print number1
Else
Print number2
End if
```

Fill in the?? in statement 1. Choose the correct answer

A. Number1 > number2 B. Number2 > number1 C. Number2 equals number1 D. Number1 <= number2

Q. A derived class may inherit from the base which of the following? (Consider assumptions as in c++) Choose the correct answer?

A. Data members

B. Member functions

C. Constructions and destructors

D. Both data members and member functions.

Q. Stuti is making a questionnaire of True-false questions. She wants to define a data-type which stores the response of the candidate for the question. What is the most-suited data type for this purpose? Choose the correct answer

A. Integer B. Boolean C. Float D. Character

Q. Which of the following options is responsible for taking files and objects from different locations and combining them for execution?

A. Linker B. Loader C. Interconnecting compiler D. Interpreter

Q. Shristi writes the code for a function that computes the factorial of the inputted number n.

function factorial (n)

{

if (n equals 1)

return 1

else

--MISSING STATEMENT---

end

}

Fill in the missing statement. Choose the correct answer?

A. Return factorial(n-1) B. Return n*factorial(n) C. return n*(n-1) D. return n*factorial(n-1)

497. A sort, which uses the binary tree concept such that any number in the Tree is larger than all the numbers in the sub tree below it is called Choose the correct answer

A. Selection sort B. Insertion sort C. Heap sort D. Quick sort

498. Shashi wants to make a program to print the sum of first 10 multiples of 5. She writes the following program, where statement 5 is missing;

Integer i=0

Integer sum=0

while(i<=50) {

sum=sum+1

--MISSING STATEMENT 5—

}

Print sum

Which of the following options will you use for statement 5? Choose the correct answer

A. l=5 B. I=5*I C. I=i+1 D. I=i+5

499. In which area of a class are data and function directly accessible outside the class? Choose the correct answer

A. Public B. Private C. Protected D. None of these

500. Every element of a data structure has an address and a key associated with it. A search mechanism deals eith teo or more values assigned to the same address y using the key. What is the search mechanism?

A. Linear search B. Binary search C. Hash coded search D. None of these

501. Which will be the input to second pass? If the list before starting the Radix sort is: 729, 150, 123, 931, 348, and 517?

A. 150,123,348,517,729,931 B. 150,931,123,517,348,729

C. 517,729,123,931,348,150 D. 123,150,348,517,729,931

502. Sorting is not possible by using which of the following methods?

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

Ans D

503. Srujan writes a sorting algorithm. The algorithm takes different of time to sort two different list of equal size. What is the possible difference between two lists?

A. All numbers in one list are more than 100, while in the others are less than 100.

B. The ordering of numbers with respect to magnitude in two list has has different properties.

C. One list has all negative numbers, while others has all positive numbers.

D. One list contains 0 as an element, while the other does not.

504. Srishti writes a program to find an element in array A[5] with following elements In order 8 30 40 45 70.she runs the program to find number x. x is found in first Iteration of binary search. What is value of x?

A. 40 B. 8 C. 70 D. 30

505. Abhinav wants to find largest number in a given list of 20 numbers. Which of following is an efficient approach to do this?

A. Use bubble sort to sort the list in ascending order and Then print first number of series
B. Use selection sort to sort the list in descending order and Then printf first number of series
C. Implement on iteration of selection sort for descending order and printf first number in series
D. None of these.

506. Null function is also known as_____

A. Anonymous function B. Generic function C. void function D. Null operator

Ans D

507. In breath first rule which of the following option is true?

A. Beginning from a node, first all its adjacent nodes are traversed.
B. Beginning from a node, each adjacent node is fully explored before traversing next adjacent node.
C. Beginning from a node, nodes are traversed in cyclical order.
D. None of these.

Ans B

508. Which one of following is lowest level format to which computer converts a higher Language program before execution?

A. English code B. Machine code C. Assembly language D. System language

Ans B

509. 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

Solution: Answer will be Option A. Option 4 can't be true as 0 is neither + ve, or –ve.

510. 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

Solution: Answer will be Option B.

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

Lowest number will be generated when a=0 and b=31

c= 2*(0-31) = -64

Highest number will be generated when a=31 and b=0

c= 2*(31-0) = 64

range = -64 to 64

bits required = 7

511. Which of the following accessibility modes can be the specifier of a top level class?

1. Private 2. Protected 3. Public 4. No modifier

A. only 3 B. only 44 C. Both 1 and 3 D. Both 2 and 3 E. Both 3 and 4

Solution: Answer will be Option A.

512. A language has 28 different letters in total. Each word in language is composed of maximum 7 letters .you want to create a data type to store a word of this language. You decide to store the word as an array of letters. How many bits will you assigns to the database to store all kind of word of language?

A. 7 B. 35 C. 28

D. 196

Solution: Answer will be Option B.

To represent 28 different letters we need 5 bits per each (2^5=32). Each word contains max letters 7. Hence number of bits=5*7=35.

513. 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

Solution: Answer will be Option A.

514. 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

Solution: Answer will be Option A.

515. 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

Solution: Answer will be Option C.

516. 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

Solution: Answer will be option B.
In queue initially the both Front and Rear assigned by the value -1 means the queue is empty.
The size of the queue is 10 (array index no from 0 to 9).
ADD 1 it will increment both Front and Rear (in case of first element)
DELETE deletion of element set the Front and Rear to -1(queue is empty)
ADD 2 Front = 0 ,Rear = 0
ADD 3 Front = 0 ,Rear = 1
ADD 4 Front = 0 ,Rear = 2
DELETE Front = 1 ,Rear = 2
DELETE Front = 2 ,Rear = 2
Now the empty location in the queue is 7 so the maximum capacity of queue is 7 . In spite 2 location is empty in left side of the last element 4 but queue cannot access these location as the front on the location 2 this is the disadvantage of simple to queue to overcome this problem circular queue is implemented.

517. A tree has 5 levels and each has either 4 children or no children. All nodes on the same level have the same number of children. How many nodes are there in the tree? (Root is Level 1)
A. 341 B. 256 C. 1024 D. None of these
Solution: Answer will be option A. 1 + 4 + 16 + 64 + 256

518. 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
Solution: Answer will be option B.

519. What will be the output of the following code statements?
integer x = 34. 54, y = 20, z =
print (y > 50 AND z > 10 or x > 30)

A. 0 B. 1 C. -1 D. 10

Solution: Answer will be option B.

520. 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

Solution: Answer will be option C.