Name: _____
RollNo: _____
Written Test, Department: _____

Instructions:
Tick mark the correct choice(s) of answer(s).
Give short answers in the space provided wherever applicable.
Each question carries one mark.

1. Can you combine the following two statements into one?

```
char *p;
p = (char*) malloc(100);
```

☐ char p = *malloc(100);
☐ char *p = (char*)malloc(100);
☐ char *p = (char) malloc(100);
☐ char *p = (char *)(malloc*)(100);

Solution: char *p = (char*)malloc(100);

2. What would be the equivalent pointer expression for referring the array element a[i][j][k][l]

☐ ((((a+i)+j)+k)+l)
☐ (((a+i)+j)+k+l)
☐ *(*(*(*(a+i)+j)+k)+l)
☐ ((a+i)+j+k+l)

Solution: *(*(*(*(a+i)+j)+k)+l)

3. Which is the parameter that is added to every non-static member function when it is called?

Solution: "this" pointer

4. What is a reference?

☐ an operator
☐ a reference is an alias for an object
☐ used to rename an object
☐ name used to define the object in C++

Solution: a reference is an alias for an object

5. Default access modifier in Java for any class is

☐ private
☐ protected
☐ public
☐ none of the above

Solution: none of the above

6. What will be printed when the following function is called in Java?

```
private static void testFunc() {
      try {
      System.out.println("In try");
      int i = 10;
      i -= 10;
      if(i == 0) {
      return;
      }
      System.out.println(50/i);
      } catch (Exception e) {
      System.out.println("In catch [" + e.getMessage() + "]");
      }
      finally {
      System.out.println("In finally");
      }
      System.out.println("Just outside try catch");
}
```

Solution: In try In finally

7. How do you get help about the command "cp"?

☐ help cp

☐ man cp

☐ cp ?

☐ none of the above

Solution: man cp

8. Given this input text **abdxyCcxyzcefacd** and regular expression **ab.*?c**. What will it match?

☐ abdxyCcxyzcefac ☐ abdxyCcxyzc ☐ abdxyCc ☐ Will not match

Solution: abdxyCc

9. Which command allows you to determine if a host is accessible to you or not?

☐ ls -la ☐ cmd ☐ pwd ☐ ping ☐ eth ☐ who

Solution: ping

10. Which command allows you to determine if a host is connected to the network?

☐ ls -la ☐ cmd ☐ pwd ☐ ping

Solution: ping

11. I want to find the differences in the lines containing the term "unix specialist" between the files foo.txt and bar.txt, and add the result to file result.unix.specialist. Which of the below commands does it?

☐ diff foo.txt bar.txt | grep "unix specialist" >> result.unix.specialist

☐ grep "unix specialist" foo.txt bar.txt > result.unix.specialist

☐ grep unix.*specialist foo.txt bar.txt | diff > result.unix.specialist

☐ diff foo.txt bar.txt | grep "unix specialist" > result.unix.specialist

Solution: diff foo.txt bar.txt | grep "unix specialist" > result.unix.specialist

12. Array representation of a max-heap H is [190,165,124,156,19,20,34,-1,-1]. Here each number corresponds to a node and -1 denotes a empty node After inserting the elements 10 and 170 into H, what is the array representation of resulting max-heap:

☐ 190,170,124,165,19,20,34,156,10 ☐ 190,170,124,165,19,20,34,10,156

☐ 190,165,124,156,19,20,34,10,170 ☐ 190,165,124,156,19,20,34,170,10

Solution: 190,170,124,165,19,20,34,10,156

13. The time complexity of finding all primes up to n is:

☐ O(n(log n)) ☐ O(n(log n)(log log n)) ☐ O(n^2) ☐ O($n^{2.5}$)

Solution: O (n(log n)(log log n))

14. "Josephus Problem" can be stated as follows. A group of 'n' people are standing in a circle, numbered consecutively clockwise from 1 to n. Starting with person no. 2, we remove every other person, proceeding clockwise. For example, if n = 6, the people are removed in the order 2, 4, 6, 3, 1, and the last person remaining is no. 5. Which data structure will you prefer to use to solve the Josephus Problem.

☐ Stack ☐ Queue ☐ Doubly Linked List ☐ Circular Linked List

Solution: Circular Linked List

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15. There is a B-tree of order m. Then the root of this tree has at least how many children (assuming that there are more than 2 levels in the tree)?

☐ m ☐ m/2 ☐ 2 ☐ cannot say

Solution: 2

16. Which of the following is true about bipartite graphs?

☐ Bipartite graphs can contain odd length cycles

☐ Bipartite graphs can contain even length cycles

☐ Every tree is a bipartite graph

☐ Every bipartite graph is a tree

☐ All the above

Solution: Bipartite graphs can contain odd length cycles Every tree is a bipartite graph

17. A snowflake schema is which of the following types of tables?

☐ Fact ☐ Dimension ☐ Helper ☐ All of the above

Solution: All of the above

18. SQL table creation and schema definition commands make up a .....

☐ DDL ☐ DML ☐ XML ☐ DRML ☐ HTML

Solution: DDL

19. Which of the following transaction instructions do not conflict?

☐ Read(A) , Write(A) ☐ Write(B), Write(B)

☐ Write(B), read(A) ☐ Write(B), read(B)

Solution: Write(B), read(A)

20. A subquery in an SQL SELECT statement is enclosed in:

☐ braces – .... ☐ CAPITAL LETTERS. ☐ parenthesis – (...) ☐ brackets – [...].

Solution: parenthesis – (...)

21. A B - tree index is to be built on the Name attribute of the relation STUDENT. Assume that all student names are of length 8 bytes, disk blocks are of size 512 bytes, and index pointers are of size 4 bytes. Given this scenario, what would be the best choice of the degree (i.e. the number of pointers per node) of the B - tree?

☐ 16 ☐ 42 ☐ 43 ☐ 44

Solution: 42

22. All the offices on the 9th floor have wall-to-wall carpeting. No wall-to-wall carpeting is pink. None of the offices on the 9th floor has pink wall-to-wall carpeting. If the first two statements are true, the third statement is

☐ true ☐ false ☐ cant say

Solution: true, If no wall-to-wall carpeting is pink and all the offices have wall-to-wall carpeting, none of the offices has pink wall-to-wall carpeting.

23. In a given code SISTER is coded as 535301. UNCLE as 84670 and BOY as 129. How is RUSTIC written in the code?

☐ 633185 ☐ 185336 ☐ 363815 ☐ 581363 ☐ None of the above

Solution: 185336

 Name: _____

24. How will you place 6 points in the plane, such that ratio of M/m is as small as possible, where M is the maximum distance possible between any two and m is the minimum distance possible between any two points

Solution: Place five points as the nodes of the pentagon and one remaining point as the centroid. The ration is the diagonal distance to length of the side of the pentagon.

25. Mary's mum has four children. The first child is called April. The second May. The third June. What is the name of the fourth child?

Solution: Mary