SECTION A

A. Answer all the following:  

1. What is meant by containership?
   A. class contains objects of other class types as its members
   B. class contains objects of other class types as its objects
   C. both a & b
   D. none of the above

2. What does derived class does not inherit from the base class?
   A. constructor and destructor
   B. friends
   C. operator = () members
   D. all of the above

3. What are the applications of binary search?
   A. To find the lower/upper bound in an ordered sequence
   B. Union of intervals
   C. Debugging
   D. All of the above

4. What does the following piece of code do?

   ```java
   for (int i = 0; i < arr.length-1; i++)
   {
   for (int j = i+1; j < arr.length; j++)
   {
   if( (arr[i].equals(arr[j])) && (i != j) )
   {
   System.out.println(arr[i]);
   }
   }
   }
   ```
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Print the duplicate elements in the array</td>
</tr>
<tr>
<td>B.</td>
<td>Print the element with maximum frequency</td>
</tr>
<tr>
<td>C.</td>
<td>Print the unique elements in the array</td>
</tr>
<tr>
<td>D.</td>
<td>None of the above</td>
</tr>
</tbody>
</table>

5 A connected planar graph having 6 vertices, 7 edges contains ___________ regions.
A. 15
B. 3
C. 1
D. 11

6 When you add a software stack, such as an operating system and applications to the service, the model shifts to _____ model.
A. SaaS
B. PaaS
C. IaaS
D. All of the above

7 Which of the following is related to service provided by Cloud?
A. Sourcing
B. Ownership
C. Reliability
D. PaaS

8 Bluetooth is an example of:
A. personal area network
B. local area network
C. virtual private network
D. none of the above

9 Which transmission media has the highest transmission speed in a network?
A. coaxial cable
B. twisted pair cable
C. optical fiber
D. electrical cable

10 Sniffers can be deployed in:
A. Wired environment
B. WiFi
C. Ethernet LAN
D. All of the above

11 Point out the wrong statement:
A. R is a language for data analysis and graphics
B. K is language for statistical modelling and graphics
C. One key limitation of the S language was that it was only available in a commercial package, S-PLUS
D. None of the above

12 Which of the following will start the R program?
A. $ R
B. R
C. * R
D. All of the mentioned

13 ___________ can be used for batch processing of data and aggregation operations.
A. Hive
B. MapReduce
C. Oozie
D. None of the mentioned
### SECTION A

#### 14

Let \( x \) and \( y \) be solutions to a system of \( n \) homogeneous linear equations. If \( z = ax + by \)

- **A.** \( z \) is a solution to the system for all \( a \) and \( b \)
- **B.** \( z \) is a solution only if \( a = 0 \) and \( b = 0 \)
- **C.** The solution has \( n - 2 \) parameters
- **D.** There are at most 2 leading variables

#### 15

The process mapping is a ______ diagram

- A. Data flow
- B. Workflow
- C. Circular
- D. Audit

### SECTION B

#### B. Answer any three of the following questions

3 \( \times \) 5 = 15 marks

1. **a.** When is a binary search best applied? Explain its application
   
   **b.** What are the different types of arguments?

2. **a.** What is exception handling?
   
   **b.** How memory is managed in Python?

3. **a.** Mention the difference between Data Mining and Machine learning?
   
   **b.** What are the five popular algorithms of Machine Learning?

4. **a.** List the advantages of Expert system.
   
   **b.** How Game theory and AI related?

5. Select a research topic of your interest in Computer science and Engineering and define your problem statement and justify

***************