



**6<sup>th</sup> Semester End Term Examination: 2021-22.**

**Subject : Advance Java**  
**Course : B.TECH [CSE]**  
**Full Marks : 70**  
**Roll No: .....**  
**Time : 3 Hours.**

**Instructions to the Candidates:**

- Read the question paper very carefully.
- Start writing from 2nd page onwards; Don't Write On The 1st Page Backside.
- Question Paper is divided into Three Parts -A, B & C.
- Part-A is containing 12 multiple choice questions.
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**PART - A**

**Multiple Choice Questions**

[12x1=12]

1. getLabel() method used to retrieve the label of a button:  
a) false  
b) true
2. The subclass of a java.awt.Component class is known as :  
a) System  
b) Container  
c) Component  
d) Element
3. What is the super class of all components of Java?  
a) java.component  
b) awt.Component  
c) java.all.Component  
d) java.awt.Component
4. In Java, what do you call an area on the screen that has nice borders and various buttons along the top border?  
a) Window  
b) Screen  
c) Container  
d) Frame

5. The client in socket programming must know which information?

- a) IP address of Server
- b) Port Number
- c) Both IP address of Server & Port number
- d) None of them

6. Which of the following code is used to get an attribute in a HTTP Session object in servlets?

- a) Session.getAttribute(String name)
- b) Session.setAttribute(String name)
- c) Session.updateAttribute(String name)
- d) Session.setAttribute(String name)

7. Which interface defines the method actionPerformed()?

- a) ActionListener
- b) ComponentListener
- c) InputListener
- d) All of them

8. What is the storage capacity of a single cookie?

- a) 4095MB
- b) 2048MB
- c) 4095 Bytes
- d) 2048 Bytes

9. Which is used to store data and partial results, as well as to perform dynamic linking, return values for methods, and dispatch exceptions?

- a) Panel
- b) window
- c) Frame
- d) container

10. Datagram is basically just a piece of information but there is no guarantee of its content, arrival or arrival time.

- a) True
- b) False

11. What does the java.net.InetAddress class represent?

- a) Socket
- b) MAC Address
- c) IP Address
- d) Datagram packets

12. Predict the output:

```
import java.awt.*;
import java.applet.*;
public class myapplet extends Applet
{
    public void paint(Graphics g)
    {
        g.drawString("A Simple Applet", 20, 20);
    }
}
```

- a) Simple Applet 20,20\
- b) A Simple Applet" 20,20
- c) A Simple Applet
- d) Syntax Error

## PART - B

### Answer any FOUR out of SIX

[4x7=28]

1. What is an IDE? Draw a neat diagram of netbeans IDE representing important components. Also explain about Design space available in an IDE.
2. Differentiate between applet and application. Write an applet code to show a Red colored rectangle.
3. Define Datagram. Explain in short any three constructors defined by Datagram Packet.
4. What is Inet address? Write a source code to get the Host name as well as IP address of "Arka Jain University".
5. Discuss about Proxy server and firewall. Write down the port number for the services echo, ftp, smtp, http, pop3.
6. Differentiate between swing and AWT in java. Design a layout and write the source code to concatenate two Strings.

## PART-C

### Answer any TWO out of FOUR

[2x15=30]

1. What is Servlet? Describe the life cycle of a servlet using block diagram.
2. What is meant by the term Event Handling in java? Write a program to show a pop-up window by implementing ActionListener having a text field, button, and visibility set as true.
3. Create a Time Table of your class using buttons only. Once a button is clicked, details of that subject should be displayed over a new page. Either use AWT or Jswing.
4. Write short notes on:
  - i) Frame
  - ii) Container
  - iii) Panel
  - iv) Factory methods



**6TH Semester End Term Examination: 2021-22.**

**Subject** : Computer Network      **Roll No:** .....

**Course** : B.Tech CSE

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**PART - A**

**Multiple Choice Questions**

[12x1=12]

1. What is the meaning of Bandwidth in Network?
  - a. Transmission capacity of a communication channels
  - b. Connected Computers in the Network
  - c. Class of IP used in Network
  - d. None of the above
2. Computer Network is
  - a. Collection of hardware components and computers
  - b. Interconnected by communication channels
  - c. Sharing of resources and information
  - d. All of the Above
3. How many layers does OSI Reference Model has?
  - a. 4
  - b. 5
  - c. 6
  - d. 7
4. What is the benefit of the Networking?
  - a. A. File Sharing
  - b. Easier Backups
  - c. Easier access to Resources
  - d. All of the Above

5. Which of the following is not the Networking Devices?
  - a. Gateways
  - b. Linux
  - c. Routers
  - d. Firewall
6. IPV4 Address is
  - a. 8 bit
  - b. 16 bit
  - c. 32 bit
  - d. 64 bit
7. DNS is the abbreviation of
  - a. Dynamic Name System
  - b. Dynamic Network System
  - c. Domain Name System
  - d. Domain Network Service
8. What is the meaning of Bandwidth in Network?
  - a. Transmission capacity of a communication channels
  - b. Connected Computers in the Network
  - c. Class of IP used in Network
  - d. None of Above
9. Which of the following is/are Protocols of Application?
  - a. FTP
  - b. DNS
  - c. Telnet
  - d. All of above
10. What is the use of Bridge in Network?
  - a. To connect lanes
  - b. To control network speed
  - c. To separate lanes
  - d. All of the above
11. Router operates in which layer of OSI Reference Model?
  - a. Layer 1 (Physical Layer)
  - b. Layer 4 (Transport Layer)
  - c. Layer 3 (Network Layer)
  - d. Layer 7 (Application Layer)
12. Bridge works in which layer of the OSI model?
  - a. Application layer
  - b. Network layer
  - c. Transport layer
  - d. Data link layer

PART B

**ANSWER ANY FOUR OUT OF SIX**

(4x7=28)

1. List the different types of transmission media?
2. Explain the characteristics of an effective data communication.
3. Explain ISO/OSI reference model with neat diagram?
4. Define topology and explain the topologies of networks?
5. Explain domain name space with an example.

6. Consider a point-to-point link 50 km in length. At what bandwidth would propagation delay (at a speed of  $2 \times 10^8$  m/sec) equal transmit delay for 100 - byte packets? What about 512-byte packets?

PART C

**Answer any two of Four**

(2x15=30)

1. Define circuit switching networks in details?
  - a. Write down the Advantages and Disadvantages of Optical Fiber.
  - b. Explain working of multiplexer with its advantages.
2. Explain uni-cast routing protocols in details?
  - a. Explain data link layer functions in detail.
  - b. What is connection-oriented service and connection less service?
3. Difference between UDP and TCP protocols?
  - a. Explain automatic repeat request (ARQ).
  - b. Differentiate between CSMA/CD and CSMA/CA
4. Explain in details of WWW?
  - a. Explain cyclic redundancy check.
  - b. Differentiate between TCP and UDP.



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**University**  
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**6<sup>th</sup> Semester End Term Examination: 2021-22.**

**Subject : Compiler Design**

**Roll No: .....**

**Course : B.TECH [CSE]**

**Full Marks : 70**

**Time : 3 Hours.**

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**PART - A**

**Multiple Choice Questions**

**[12x1=12]**

1. What is a compiler?
  - a) System program that converts instructions to machine language
  - b) System program that converts machine language to high-level language
  - c) System program that writes instructions to perform
  - d) None of the mentioned
2. Which of the following derivations does a top-down parser use while parsing an input string?
  - a) Leftmost derivation
  - b) Rightmost derivation
  - c) Leftmost derivation in reverse
  - d) Rightmost derivation in reverse
3. The intermediate code form is
  - a) Quadruples
  - b) Indirect triples
  - c) Triples
  - d) All of them
4. Who is responsible for the creation of the symbol table?
  - a) Assembler
  - b) Interpreter
  - c) Compiler
  - d) All of the mentioned

- T → id
4. What is Ambiguous grammar? Explain with example. Check whether the given grammar is Ambiguous or not.  
 $E \rightarrow E+E / E^*E / (E) / id$
5. Prove that the following grammar is LL(1) grammar.  
 $S \rightarrow aBDh \quad B \rightarrow cC \quad C \rightarrow bc / \epsilon \quad D \rightarrow EF \quad E \rightarrow g / \epsilon \quad F \rightarrow f / \epsilon$
6. Eliminate left recursion for the following grammar  
 $A \rightarrow ABd / Aa / a$   
 $B \rightarrow Be / b$

PART-C

Answer any TWO out of FOUR

[2x15=30]

- Write short notes on the following :
  - Syntax directed Translation Scheme
  - Symbol Table and its structure
- Explain 3 Address code and Static Single Assignment(SSA) with example.
  - For the expression  $(x+y)^*(y+z)+(x+y+z)$
  - Write the Quadruple, triples and indirect triples representations.
- Consider the following grammar
  - $S \rightarrow AA$
  - $A \rightarrow aA / b$

Design the Canonical LR Parsing Table for and LALR Parser Parsing

4. (a) Construct First and Follow for the Grammar

- $S \rightarrow aABb$
  - $A \rightarrow c / \epsilon$
  - $B \rightarrow d / \epsilon$
- (b) Draw a DAG(Directed Acyclic Graph) for the following expression  
 $a+a^*(b+c) + (b-c)^*d$

5. In which class does recursive descent parsing belong?  
 a) Top Down Parsing  
 b) Predictive Parsing  
 c) Bottom up parsing  
 d) None
6. Which of the following is a stage of compiler design?  
 a) Semantic analysis  
 b) Code generator  
 c) Intermediate code generator  
 d) All of the mentioned
7. Which of the following is essential for converting an infix expression to the postfix from efficiently  
 a) An operator stack  
 b) A Parse tree  
 c) An operand stack  
 d) All of them
8. What is the compiler called which runs on one machine and produces code for a different machine?  
 a) Optimizing compiler  
 b) Cross compiler  
 c) One pass compiler  
 d) Multipass compiler
9. Characters are grouped into tokens in which of the following phase of the compiler design?  
 a) Code generator  
 b) Parser  
 c) Lexical analyzer  
 d) Code optimization
10. Identify the interpreted language  
 a) JAVA  
 b) Visual Basic  
 c) C++  
 d) Both a and c
11. When is type checking done?  
 a) During Lexical Analysis  
 b) During Syntax Analysis  
 c) During Syntax Directed Translation  
 d) During Code Optimization
12. Which of the following errors can a compiler check?  
 a) Logical  
 b) Syntax  
 c) Runtime  
 d) All of these

PART - B

Answer any FOUR out of SIX

[4x7=28]

- What is Compiler? Discuss about Syntax Analysis .
- Write and explain different phases of compiler. Write the role of Lexical analyzer.
- Design the SLR parsing table for the given grammar



**6TH Semester End Term Examination: 2021-22.**

**Subject** : Machine Learning      **Roll No:** .....

**Course** : B.Tech CSE

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**PART - A**

**Multiple Choice Questions**

[12x1=12]

1. Successful applications of ML
  - a. Learning to recognize spoken words
  - b. Learning to drive an autonomous vehicle
  - c. Learning to classify new astronomical structures
  - d. Learning to play world-class backgammon
2. Father of machine learning (ML)
  - a. Geoffrey Chaucer
  - b. Geoffrey Everest Hinton
  - c. Geoffrey hill
  - d. None of the above
3. Concept learning inferred a \_\_\_\_\_ valued function from training examples of its input/ output.
  - a. Decimal
  - b. Hexadecimal
  - c. Boolean
  - d. All of the above

12. Which of the following is not a supervised learning?
- Naive Bayesian
  - Linear Regression
  - PCA
  - Decision Tree

PART B

Answer any Four out Of Six

(4x7=28)

- Describe briefly the history of machine learning?
- How can we use machine learning for problem solving?
- Discuss classification and regression.
- What are the steps used to design a learning system?
- Explain with an example the supervised learning.
- Let blue, green, and red be three classes of objects with prior probabilities given by  $P(\text{blue}) = 1/4$ ,  $P(\text{green}) = 1/2$ ,  $P(\text{red}) = 1/4$ . Let there be three types of objects pencils, pens, and paper. Let the class-conditional probabilities of these objects be given as follows. Use Bayes classifier to classify pencil, pen and paper  
 $P(\text{pencil/green}) = 1/3$   $P(\text{pen/green}) = 1/2$   $P(\text{paper/green}) = 1/6$   $P(\text{pencil/blue}) = 1/2$   $P(\text{pen/blue}) = 1/6$   $P(\text{paper/blue}) = 1/3$   $P(\text{pencil/red}) = 1/6$   $P(\text{pen/red}) = 1/3$   $P(\text{paper/red}) = 1/2$ .

PART C

Answer any two out of Four:

(2x15=30)

- List the issues in Decision Tree Learning. Interpret the algorithm with respect over fitting the data.
  - Explain how to learn Multilayer Networks using Gradient Descent Algorithm
  - Explain the concept of Bayes theorem with an example.
- Explain the k-Means Algorithm with an example.
  - Explain the concept of EM Algorithm.
  - Describe K-nearest Neighbor learning Algorithm for continuous valued target function.
- Define the following terms
  - Sample error
  - True error
  - Random Variable

4. Which of the following is not type of learning?

- Unsupervised Learning
- Supervised Learning
- Semi-unsupervised Learning
- Reinforcement Learning

5. Which of the following is a disadvantage of decision trees?

- Factor analysis
- Decision trees are robust to outliers
- Decision trees are prone to be overfitted
- None of the above

6. How do you handle missing or corrupted data in a dataset?

- Drop missing rows or columns
- Replace missing values with mean/median/mode
- Assign a unique category to missing values
- All of the above.

7. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?

- Decision Tree
- Regression
- Random Forest
- Classification

8. In language understanding, the levels of knowledge that does not include?

- Empirical
- Phonological
- Logical
- Syntactic

9. Designing a machine learning approach involves

- Choosing the type of training experience
- Choosing the target function to be learned
- Choosing a representation for the target function
- All of the above

10. Concept learning inferred a \_\_\_\_\_ valued function from training examples of its input and output.

- Decimal
- (Boolean)
- Hexadecimal
- All of the above

11. Which of the following is not a supervised learning?

- Naive Bayesian
- Linear Regression
- PCA
- Decision Tree (Boolean)





**6<sup>th</sup> Semester End Term Examination: 2021-22.**

**Subject : Graph Theory**  
**Course : B.TECH [CSE]**  
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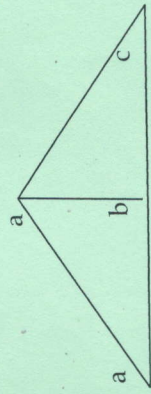
**PART - A**

**Multiple Choice Questions**

**[12x1=12]**

1. What is the number of edges present in a complete graph having  $n$  vertices?  
a)  $(n*(n+1))/2$       c)  $(n*(n-1))/2$   
b)  $n$                       d) Information given is insufficient
2. Which of the following properties does a simple graph not hold?  
a) Must be connected  
b) Must be unweighted  
c) Must have no loops or multiple edges  
d) Must have no multiple edges
3. A graph with all vertices having equal degree is known as a \_\_\_\_\_  
a) Multi Graph      c) Regular Graph  
b) Simple Graph    d) Complete Graph
4. Which of the following ways can be used to represent a graph?  
a) Adjacency List and Adjacency Matrix  
b) Incidence Matrix  
c) Adjacency List, Adjacency Matrix as well as Incidence Matrix  
d) No way to represent

- Define Spanning Tree, Rooted Tree and Full Binary Tree. Give one example for each.
- What is Bipartite graph? Explain with example.
- Find all Spanning Trees of the following graph.

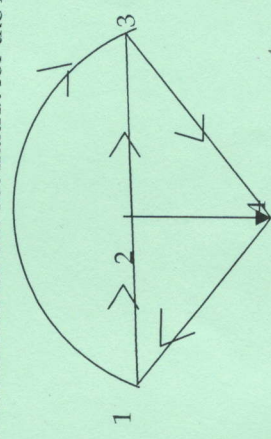


**PART-C**

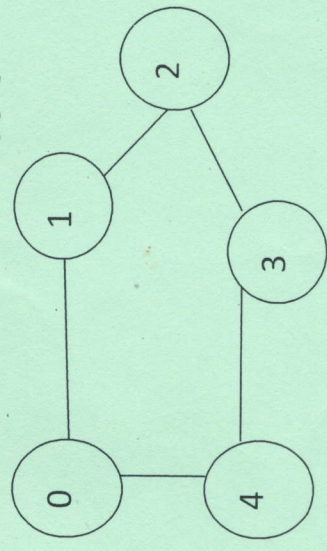
**Answer any TWO out of FOUR**

[2x15=30]

- Define Chromatic Number of a Graph with example.
  - What is vertex coloring and region coloring?
  - Explain four color problem in a directed graph.
- Find the fundamental cut-set matrix for the following graph



- Define 1-isomorphism and 2-isomorphism.
  - What will be the adjacency matrix of the following graph?



- Define incidence matrix with example.
  - Write the Floyd Warshall's algorithm to find the shortest path between all pair of vertices in a graph.
 

Explain Hamiltonian cycle with example.

- A graph having an edge from each vertex to every other vertex is called a
  - Tightly Connected
  - Weakly Connected
  - Strongly Connected
  - Loosely Connected

- If the origin and terminus of a walk are same then the walk is
  - Open
  - Closed
  - None of these

- The degree of any vertex of a graph is.
  - The number of edges incident with vertices
  - The number of vertices in a graph.
  - Number of vertices adjacent to the vertex
  - Number of edges in a graph

- A connected acyclic graph is known as \_\_\_\_\_.
  - Cyclic graph
  - Regular Graph
  - Tree
  - Not a graph

- A graph with  $n$  vertices will definitely have a parallel edges or self loop, if the total number of edges are
  - more than  $n$
  - more than  $n(n+1)/2$
  - more than  $n+1$
  - more than  $n(n-1)/2$

- The maximum degree of any vertex in a simple graph with  $n$  vertices
  - $n-1$
  - $n+1$
  - $2n-1$
  - $n$

- What is the condition for proper coloring of a graph?
  - Two vertices having a common edge should not have same color
  - Two vertices having a common edge should always have same color
  - All vertices should have a different color
  - All vertices should have same color

- The number of colors used by a proper coloring graph is called?
  - $k$  coloring graph
  - $x$  coloring graph
  - $m$  coloring graph
  - $n$  coloring graph

**PART - B**

**Answer any FOUR out of SIX**

[4x7=28]

- Define walk, path and Circuit in a graph. Define planner graph.
- Show that the maximum number of edges in a simple graph with  $n$  vertices is  $n(n-1)/2$ .
- Define isomorphism with suitable example. Explain Euler graph.