

B.Sc. Cyber Security

Roll No.

Total No. of Pages : 02

Total No. of Questions : 07

B.Sc. (Cyber Security) (Sem.-4)

**WEB TECHNOLOGIES**

Subject Code : UGCA1927

M.Code : 93442

Date of Examination : 17-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :

- What is a Web server?
- Briefly explain the structure of HTML page.
- What are paired HTML tags?
- Differentiate between ordered and unordered lists in HTML.
- What is the difference between internal and external document reference?
- How to use BGCOLOR attribute in HTML?
- Define DHTML.
- What is the importance of Form tag in HTML?
- How Boolean can be used in JavaScript?
- List various operators in JavaScript.

**SECTION-B**

- What is Internet and how does it work? What is internet domain? How are addresses defined on Internet? Explain.
- Discuss the general structure of HTML tag. Discuss various HTML tags in brief. Illustrate their use and importance with example.
- How tables are created in HTML? Write down the various tags used while creating a table in HTML.
- Give a brief description of the following in the context of HTML :
  - Button.
  - Checkbox element.
  - Radio element.
  - Text Area element.
- Explain if-else, while and for loop used in JavaScript.
- Write short notes on the following in the context of JavaScript :
  - Array.
  - JSON.
  - Functions.

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Roll No.

Total No. of Pages : 03

Total No. of Questions : 07

B.Sc. (Cyber Security) (Sem.-1)

MATHEMATICS

Subject Code : UGCA1901

M.Code : 92569

Date of Examination : 17-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :

a) Which of the following sets are null sets :  $A = \{x : x < 1 \text{ and } x > 3\}$  and  $B = \{x : x^2 = 9 \text{ and } 3x = 7\}$

b) If  $A = \{1,2,3,4,5,6\}$  and  $B = \{1,2\}$  then verify that  $A - (A - B) = A \cap B$ .

c) Write the following statements in symbolic form :

- If you work hard, you will get first division
- If it rains then he will not go to Jammu.

d) Give the truth table for the statement :  $(p \wedge q) \rightarrow (p \wedge q)$ .

e) Find the matrix  $X$  such that  $A + 2B + X = 0$  where  $A = \begin{bmatrix} 2 & -1 \\ 3 & 5 \end{bmatrix}$  and  $B = \begin{bmatrix} -1 & 1 \\ 0 & 2 \end{bmatrix}$ .

f) If  $x \begin{bmatrix} 2 \\ 3 \end{bmatrix} + y \begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 5 \end{bmatrix}$ . Find the values of  $x$  and  $y$ .

g) Find the sum of the series  $72 + 70 + 68 + \dots + 40$

h) Difference between A.P. and G.P. series.

i) Which term of the G.P.  $2, 2\sqrt{2}, 4, \dots$  is 128?

j) If  $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$  are in A.P. Prove that  $a^2, b^2, c^2$  are in A.P.

**SECTION-B**

2. a) Prove that  $A \cap (A \cup B) = A \cap B$ .

b) In a group of 50 persons, 14 drink tea but not coffee and 30 drink tea. Find the number of persons who drink tea and coffee both and also the number of person who drink coffee but not tea?

3. a) Check the validity of the argument : If I work, I cannot study. Either I work or pass the Mathematics. I passed the Mathematics, Therefore I study.

b) Show that  $(\sim p \wedge \sim q) \rightarrow (p \rightarrow q)$  is a tautology.

4. a) Verify  $(AB)C = A(BC)$  for  $A = \begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$  and  $C = \begin{bmatrix} -3 & 1 \\ 2 & 0 \end{bmatrix}$ .

b) If  $\begin{bmatrix} a+b & 2 \\ 5 & b \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 2 & 2 \end{bmatrix}$ . Then Find a.

5. a) If  $A = \begin{bmatrix} 2 \\ -4 \\ 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 6 & 3 & -1 \end{bmatrix}$  then verify that  $(AB)' = B' A'$ .

b) Find the matrix  $A$  such that  $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} A = \begin{bmatrix} 2 & 3 & 5 \\ 1 & 0 & 1 \end{bmatrix}$

6. a) If  $A$  is the A.M. between  $a$  and  $b$ . Prove that  $\frac{A+2a}{A-b} + \frac{A+2b}{A-a} = 4$ .

b) The sum of three numbers in A.P. is 9 and the sum of their squares is 59. Find the numbers.

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7. a) Find the sum of the first  $n$  terms and the sum of the first five terms of the geometric

$$\text{series } 1 + \frac{1}{3} + \frac{1}{9} + \dots + 3^{n-1} + \dots$$

b) If  $x = 1 + a + a^2 + \dots + a^{n-1}$  and  $y = 1 + b + b^2 + \dots + b^{n-1}$

$$\text{Prove that } 1 + ab + (ab)^2 + \dots + (ab)^{n-1} = \frac{xy}{x + y - 1}$$

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B.Sc. (Cyber Security) (Sem.-4)  
**NETWORK SECURITY**  
Subject Code : UGCA-2001  
M.Code : 93437

Date of Examination : 19-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

**1. Write briefly :**

- What is a firewall and how does it help to improve network security?
- Intrusion Detection system.
- Define cipher.
- What is a digital signature?
- What is Secure Electronic Transaction?
- What do we mean by authentication?
- How many keys are used by RSA algorithm?
- What is cryptanalysis?
- Define message digest.
- What is a malware?

**SECTION-B**

- Explain in detail the OSI security architecture and its components.
- What is the difference between passive and active security attacks? Explain counter measure to protect the network from these attacks.
- Explain in detail the network security services.
- What is cryptography? What is the difference between a block cipher and a stream cipher? Write a short note on RSA Algorithm.
- List and explain different types of attacks. Give examples of each one.
- Explain the principle of Public Key Cryptography. What is the difference between symmetric and asymmetric encryption methods in network security?

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**B.Sc. (Cyber Security) (Sem.-4)  
DATABASE MANAGEMENT SYSTEM**

Subject Code : UGCA1922

M.Code : 93436

Date of Examination : 26-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

- Write briefly :
  - List few disadvantages of file processing systems.
  - What is physical data independence?
  - List few symbols used in ER model.
  - What is the difference alter and update command used in SQL?
  - What is meaning of functional dependence  $x \rightarrow y$ ?
  - What is a natural join?
  - What is entity integrity constraint?
  - ACID stands for what?
  - What is log base recovery?
  - What is a cursor?

**SECTION-B**

- Compare and contrast different database models. Discuss also the application of each database model.
- What are stored procedures used in PL/SQL? Write syntax to create a stored procedure with multiple parameters.
- Discuss the concept of normalization in databases. Explain 1NF, 2NF and 3NF in detail with the help of a suitable example.
- What are the main problems in using Concurrency? Discuss different Concurrency management techniques used in DBMS.
- Define distributed databases. Discuss the design of distributed databases along with the working of distributed databases.
- Write a short note on :
  - Order By and Group By clause in SQL.
  - Relational Algebra (Select Name from user where age >25. Convert this SQL query into relational algebra).

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B.Sc. (Cyber Security) (Sem-1)

**HUMAN VALUES, DE-ADDICTION AND TRAFFIC RULES**

Subject Code : HVPE-101-18

M.Code : 92577

Date of Examination : 29-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.

**SECTION-A**

(10 × 2 = 20)

**1. Fill in the blanks / True / False :**

- ..... is right evaluation.  
..... सही मूल्यांकन है।
- To be in a state of liking is .....  
पसंद के हिसाब से एक अवस्था में होना ..... है।
- We should not operate only on the basis of pre .....  
पसंद के हिसाब से ही कार्य नहीं करना चाहिए।
- हमें केवल पूर्व ..... के आधार पर कार्य नहीं करना चाहिए।
- सातुं सिरुड पुरुव ..... के आधार पर कार्य नहीं करना चाहिए।
- Self-exploration is the process for ..... education.  
आत्म-अध्ययन ..... शिक्षा के लिए प्रक्रिया है।
- Existence is ..... submerged in space.  
सर्व-अपिअन ..... सिधिया लही पुरिधिया है।
- Existence is ..... submerged in space.  
अस्तित्व का मतलब है अंतरिक्ष में समाई हुई .....।
- असतीतव दा मतलुब है आकास विच समेदी हेली .....।

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(S-105) 1432

(vi) Holistic technologies are eco-friendly and people-friendly.

सम्पूर्ण तकनीक पर्यावरण के अनुकूल और लोगों के अनुकूल हैं।

सबसे अधिक उन्नत तकनीकें पर्यावरण के अनुकूल अਤੇ लोकों के अनुकूल हन।

(vii) Animal order in nature contains ..... and .....

प्रकृति में पशु आदेश में ..... और ..... होता है।

कुदरत विच पशु आदेश विच ..... अते ..... हुंदा है।

(viii) Value Education should be rational

मूल्य शिक्षा तर्कसंगत होनी चाहिए।

मुल सिधिया उरकसंगत हुंदा चारीदी है।

(ix) Giving of all the priorities to Physical Facilities is living with Animal consciousness.

भौतिक सुविधाओं को सभी प्राथमिकताएँ देना पशु चेतना के साथ रहना है।

सरीरक सदुलता हुं ही सारीआं पहिलां देतीआं पशु चिबती नाल रहितां है।

(x) The basic human aspirations are .....

बुनियादी मानवीय आकांक्षाओं हैं .....

बुनियादी मानवीय आकांक्षाएँ हन .....

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**SECTION-B**

(4 × 10 = 40)

2. What are the problems we are facing today because of operating on the basis of pre-conditioned desires?

पूर्व-मानता इच्छाओं के आधार पर परिचालन करने से हम आज क्या-क्या समस्याओं का सामना कर रहे हैं?

पुरुव-मानता इच्छाओं के आधार पर परिचालन करने से हम आज क्या-क्या समस्याओं का सामना कर रहे हैं?

3. Human being is co-existence of Self and body, explain.

इंसान स्वयं और शरीर का सह-अस्तित्व है, समझाओ।

इन्सानन मै अते सरीर दा सहि-असतीतव है, समझाओ।

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(S-105) 1432

4. Differentiate intention and competence. How do we come to confuse between the two?

ਫ਼ਰਾਦਾ ਅੱਰ ਖ਼ਸਤਾ ਕੇ ਭੀਚ ਕਯਾ ਅੰਤਰ ਹੈ? ਕੈਸੇ ਹਮ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀਂ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

5. Explain Competence in Professional-Ethics.

ਪੇਸ਼ੇਵਰ ਐਥਿਕਸ ਵਿੱਚ ਖ਼ਸਤਾ ਸਮਝਾਓ।

ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਸਮਰੱਥਾ ਸਮਝਾਓ।

6. Explain harmony in family.

ਧਰਿਕਾਰ ਮੇਂ ਗਲਮੇਲ ਕੇ ਭਾਰੇ ਮੇਂ ਕਰਾਏ।

ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

7. What is happiness? What is the wrong notion about attaining happiness? What are the problems faced due to the wrong notions about happiness and prosperity?

ਸੁਖ ਕਯਾ ਹੈ? ਖੁਸ਼ੀ ਕੀ ਗ਼ਲਤ ਕਾਰਨੇ ਕੇ ਭਾਰੇ ਮੇਂ ਗਲਤ ਖ਼ਾਰਯਾ ਕਯਾ ਹੈ? ਸੁਖ ਅੱਰ ਸਮਰੱਥਾ ਕੇ ਭਾਰੇ ਮੇਂ ਗਲਤ ਖ਼ਾਰਯਾ ਕੇ ਕਾਰਨ ਪੇਸ਼ਾ ਆ ਰਹੀ ਸਮਸਯਾਏਂ ਕਯਾ ਹੈ?

ਖੁਸ਼ੀ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ? ਸੁਖ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾਵਾਂ ਦੇ ਕਾਰਨ ਪੇਸ਼ਾ ਆ ਰਹੀਆਂ ਸਮਸਯਾਵਾਂ ਕੀ ਹਨ?

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**B.Sc. (Cyber Security) (Sem-2)  
FUNDAMENTALS OF CYBER SECURITY**

Subject Code : UGCA-1971

M.Code : 91716

Date of Examination : 30-05-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Answer Briefly :
  - a) Define term vulnerability.
  - b) What is difference between cyber security and information security?
  - c) What are active threats?
  - d) Why few websites use captchas?
  - e) What is rule for choosing a strong password?
  - f) What is difference between authorization and authentication?
  - g) What are cookies?
  - h) List popular attacks on availability of infrastructure over the Internet.
  - i) What is meaning of term ethical hacking?
  - j) How we can protect our smartphone?

**SECTION-B**

2. What are threats? Discuss few vulnerabilities of Internet that lead to the attackers to launch various kinds of attack.
3. What is role of Wi-Fi security? Discuss few best practices used for wireless network security.
4. Discuss few important safety tips followed for using social media over the Internet.
5. Discuss the social, ethical and legal aspects of cyber security in India.
6. What is firewall? How Firewall works? Discuss different types of firewalls.
7. Write a short note on :
  - a) Different online frauds
  - b) Android Security.

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**B.Sc. (Cyber Security) (Sem-2)  
OBJECT ORIENTED PROGRAMMING USING C++**

Subject Code : UGCA-1919

M. Code : 91717

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Answer briefly:

- Virtual Function
- Procedure-Oriented Language
- Role of Compiler
- Overloading of Operator
- Copy Constructor
- Polymorphism
- Member Function
- Abstract Class
- Private Class
- Hybrid inheritance.

**SECTION-B**

- Explain Features of C++ Language. Explain its Benefits over Procedure Oriented Language.
- What do you understand by Class and its member functions? Explain by writing a Program in C++.
- How is memory managed by using different types of Constructors and destructors? Explain with suitable examples.
- List various advantages of inheritance by writing a Program in C++. Explain its types also.
- Differentiate between early binding and late binding by taking suitable examples.
- Write a note on various functions available in File Handling in C++.

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B.Sc. (Cyber Security) (Sem-2)

**OPERATING SYSTEMS**

Subject Code : UGCA1923

M.Code : 91715

Date of Examination : 05-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

- Write briefly :
  - Write at least two functions of an Operating System.
  - Explain the term PCB.
  - Differentiate between Program and Process.
  - Explain in brief about address binding.
  - What is demand paging? Explain
  - Write at least two advantages of Virtual Memory.
  - Why is disk scheduling important?
  - What is a File? List the various file attributes.
  - Explain in brief about multiprocessor scheduling.
  - List characteristics of Real Time Operating System.

**SECTION-B**

- What is CPU Scheduling? Explain the different scheduling criteria. Explain FCFS and SJF scheduling algorithms with a suitable example.
- Write a detailed note on role of operating system as a resource manager.
- Explain the paging scheme of memory management in detail.
- What is the need of Page replacement? Consider the following reference string  
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1  
Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with three free frames which are empty initially. Which algorithm gives the minimum number of page faults?
- Write a detailed note on following :
  - Remote File Systems
  - File Access Methods.
- Write a detailed note on Distributed Operating System.

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B.Sc. (Cyber Security) (Sem-2)

**OPERATING SYSTEMS**

Subject Code : UGCA1923

M.Code : 91715

Date of Examination : 05-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :

- Write at least two functions of an Operating System.
- Explain the term PCB.
- Differentiate between Program and Process.
- Explain in brief about address binding.
- What is demand paging? Explain
- Write at least two advantages of Virtual Memory.
- Why is disk scheduling important?
- What is a File? List the various file attributes.
- Explain in brief about multiprocessor scheduling.
- List characteristics of Real Time Operating System.

**SECTION-B**

- What is CPU Scheduling? Explain the different scheduling criteria. Explain FCFS and SJF scheduling algorithms with a suitable example.
- Write a detailed note on role of operating system as a resource manager.
- Explain the paging scheme of memory management in detail.
- What is the need of Page replacement? Consider the following reference string

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with three free frames which are empty initially. Which algorithm gives the minimum number of page faults?

6. Write a detailed note on following :

- Remote File Systems
- File Access Methods.

7. Write a detailed note on Distributed Operating System.

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B.Sc. (Cyber Security) (Sem.-2)  
ENVIRONMENTAL STUDIES

Subject Code : EVS102-18

M.Code : 91721

Date of Examination : 07-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

- Write briefly :
  - Why is 'environmental studies' considered as interdisciplinary?
  - How does Desertification occur?
  - Define Biodiversity. How is it to be conserved?
  - How does the phenomenon of 'Eutrophication' occur?
  - Define Food Web and Food Chain.
  - List any four urban problems related to energy.
  - Why is 'rain water harvesting' important?
  - List any four mitigation measures of Floods.
  - What is 'Red Data Book'?
  - How do you think IT is useful in environmental protection?

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**SECTION-B**

- Discuss the recent issues related to global effects of air pollution.
- "Water resources are under severe stress in Punjab". Explain the major issues and possible solutions.
- Do you think electric vehicles can solve energy crisis or pollution problems to a certain extent? Critically assess.
- What are ChloroFluoroCarbons (CFC)? What are its major uses? Explain its significance in global atmospheric change.
- Write notes on :
  - Nuclear hazards and health effects
  - Ecological Pyramids.
- Consider that you are in-charge of the environmental conservation in your campus. Discuss what all data you would collect and propose strategies for environmental conservation in your campus.

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B.Sc. (Cyber Security) (Sem.-3)

DATA STRUCTURES

Subject Code : UGCA-1915

M. Code : 92752

Date of Examination : 09-06-2023

Max. Marks : 60

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

1. Write briefly :
  - a. Differentiate between Threaded Binary Tree and Binary Tree.
  - b. How does space complexity affect performance of a program?
  - c. What is importance of Hashing?
  - d. How linked list helps in optimal memory allocation?
  - e. Differentiate between BFS and DFS algorithms for a graph.
  - f. Which of the data structure is most useful for Recursion?
  - g. What are the applications of De-queue?
  - h. What are the types of binary tree that are designed to maintain balancing?
  - i. Write down steps of Linear Search Algorithm.
  - j. Compare best and worst case of Bubble Sort, Insertion Sort, Quick Sort and Heap Sort.

**SECTION-B**

2. How can you implement stack using linked list? Illustrate.
3. How binary search trees are helpful in information searching in comparison to other data structures?
4. What are the various steps involved in insertion sort? Explain with example. Illustrate space and time complexity of insertion sort.
5. What are the applications of Graph? Discuss different operations on Graph. Discuss different Graph traversal algorithms.
6. What is the benefit of using AVL Trees as data structure? How Binary Search Trees are different from AVL Trees? Explain with suitable example.
7. Write briefly about :
  - a. Perfect Hashing
  - b. Circular Doubly Linked List
  - c. Priority Queue
  - d. Static versus Dynamic Memory Allocation.

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