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Established under Govt. of Maharashtra Act No. V of 2023
Sate, Maval (PMRDA) Dist - Pune, Maharashtra - 412 106.

SCHOOL OF SCIENCE

DEPARTMENT OF BSc (Cyber Security)

ACADEMIC YEAR: - 2024-25(ODD SEM.)

CLASS TEST-II EXAMINATION – OCTOBER- 2024

Program : BSc (Cyber Security) **Batch : 2023-26** **Semester: III**

Maximum Marks: 20 marks **Date: -15th October 2024** **Time: 1 Hr.**

Course Name: Web Application Security **Course Code : UBS203**

Course Outcomes (CO):

1. Identify the need of web Application Security.
2. Classify the different security mechanisms in web applications.
3. Use security principles to design a reliable web application.
4. Categorize the different attacks in web applications.
5. Designing a secure web application.

Instructions:

- **Answer any 4 out of the 5 questions provided.**
- **Each question carries equal marks.**
- **Where applicable, provide examples to support your answers.**

	Question	CO	BL	Marks
Q.1	What are the core principles of web application security, and how do they help in ensuring the confidentiality, integrity, and availability of a web application?	2	I	5 M
Q.2	What are some "rules of thumb" that developers should follow to maintain strong web security practices when designing and developing applications?	2	I	5 M
Q.3	Explain Cross-Site Scripting (XSS) with example?	3	II	5 M
Q.4	Discuss the vulnerabilities in traditional client-server applications and modern web applications?	4	V	5 M
Q.5	Explain is client state manipulation, and how can attackers exploit insecure client-side storage (such as cookies or local Storage) to manipulate the state of a web application?	4	II	5 M

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End-Semester Assessment – Nov/Dec- 2024

Program : B.Sc. (Cyber Security) Semester: III

Maximum Marks: 60 marks Time: 2.5 hrs.

Course Name: Security Assessment and Risk Analysis **Course Code:** UBS206/SEC

Course Outcomes (CO):

1. Define the core concepts of computer security.
2. Explain the design patterns of software design.
3. Illustrate the best practices for designing a secure software model.
4. Select the various data encryption mechanisms used in various businesses.
5. Simplify the need of having a secured development framework

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CO	BL	Marks
Q1) a) What is a trusted computing base (TCB), and why is it essential in secure software design?	**CO1**	**1**	**5 Marks**
b) Describe the process of threat modeling and how it helps in designing secure software systems.	**CO1**	**1**	**5 Marks**
Q.2) a) What are design patterns in software design? Discuss how they support secure software development.	**CO2**	**2**	**5 Marks**
b) Describe quality assurance activities and strategies that help in early vulnerability detection during the software design phase.	**CO2**	**2**	**5 Marks**
Q.3) a) Illustrate how project security risks can be identified and how appropriate risk management strategies can be selected.	**CO3**	**2**	**5 Marks**
b) Describe the role of security testing in software assurance. How do techniques such as penetration testing and risk-based security testing help ensure reliability?	**CO3**	**2**	**5 Marks**
Q.4) Examine the importance of software security in enterprise business environments, focusing on how identification and authentication mechanisms play a crucial role in protecting sensitive data. **OR**	**CO4**	**4**	**(10 marks)**
Q.4) Discuss the role of hashing algorithms and message digests in ensuring data integrity within enterprise businesses. Provide examples of commonly used algorithms and explain how they protect against data breaches.	**CO4**	**4**	**(10 marks)**
Q.5) a) Discuss the need for having a security development framework in the context of modern software development. Why is it crucial for ensuring the security of information systems?	**CO5**	**3**	**(10 marks)**

b) Explain how security development frameworks address security issues associated with e-business systems. What are the key benefits of adopting these frameworks for business security?	**CO5**	**3**	**(10 marks)**
OR			
Q.5) Using a case study, explain how a specific security framework was successfully implemented to protect an e-commerce or e-business system. What lessons can be learned from the case study?	**CO5**	**3**	**(20 marks)**

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End-Semester Assessment – Nov/Dec- 2024

Program : BSC (CS)

Semester: III

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Web Application Security

Course Code: UBS203

Course Outcomes (CO):

1. Identify the need of web Application Security.
2. Classify the different security mechanisms in web applications.
3. Use security principles to design a reliable web application.
4. Categorize the different attacks in web applications.
5. Designing a secure web application.

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CO	BL	Marks
Q1) a) What are the drawbacks of web applications ?	CO1	I	5 Marks
b) Explain authentication and authorization in the context of web applications. Describe the different methods used for each?	CO1	II	5 Marks
Q.2) a) Explain Rules of Thumb in Web Security?	CO2	II	5 Marks
b) Outline the key phases of the Microsoft Security Development Lifecycle (SDL). For five phase, briefly describe its objectives and the activities involved.?	CO2	II	5 Marks
Q.3) a) Explain the Same-Origin Policy (SOP) and exceptions to SOP.?	CO3	II	5 Marks
b) Simplify the concept of XSS, including types and provide an example of any one type?	CO3	IV	5 Marks
Q.4) Explain how client-side state manipulation can be exploited by attackers, particularly in scenarios involving hidden fields, cookies, and local storage. OR	CO4	V	(10 marks)
Q.4) Explain how SQL injection works and provide an example of a vulnerable SQL query. Discuss how an attacker can manipulate this vulnerability to access or modify a database. Finally, describe two key techniques used to prevent SQL injection attacks.	CO4	V	(10 marks)
Q.5) Explain the security risks associated with iframes, and discuss the browser sandbox. OR Q.5) Discuss a JavaScript timing and Remote Scripting attack and What are techniques used to mitigate the risk of these attacks?	CO5	VI	(10 marks)
Q.6) Explain how image tags can be exploited, especially using the onerror event handler, and discuss two security measures that can be	CO5	VI	(10 marks)

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taken to prevent such exploits?

OR

Q.6) How can improper handling of rendering and events lead to XSS vulnerabilities? Discuss two mitigation techniques for preventing XSS in modern web applications.

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End-Semester Assessment – Nov/Dec- 2024

Program: BSc (Computer Science) **Semester: III**

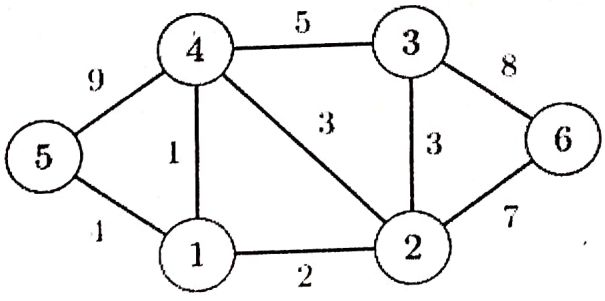
Maximum Marks: 60 marks **Time: 2.5 hrs.**

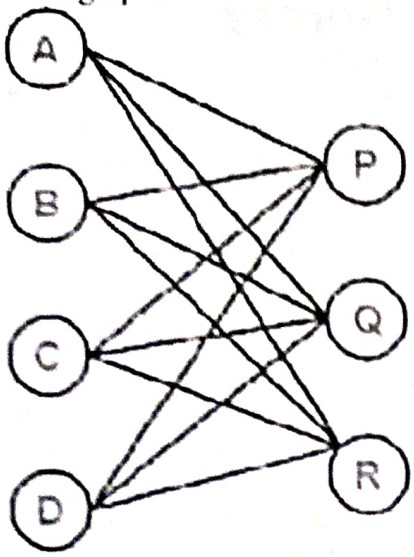
Course Name: Design Analysis of Algorithm **Course Code: UBS201**

Course Outcomes (CO):

1. Students will be able to define the various problem types and algorithms.
2. Explain a problem into two or more sub-problems of the same or related type.
3. Apply knowledge of different algorithm design techniques for a given problem.
4. Analyze different algorithm design techniques.
5. Examine the techniques to account for the true cost of the computation.

Instructions:
- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CO	BL	Marks
Q1) a) State characteristics of good algorithm and explain time and space complexity of an algorithm.	CO1	1	5 Marks
b) Write an algorithm for Tower of Hanoi	CO1	1	5 Marks
Q.2) a) Discuss divide and conquer strategy with diagram	CO2	2	5 Marks
b) Find the shortest route by travelling salesman problem using Brute Force method. Cities: A, B, C, D. Distances between cities (in km): •A to B: 10, •A to C: 15, •A to D: 20, •B to C: 35, •B to D: 25 •C to D: 30	CO2	2	5 Marks
Q.3) a) Apply Kruskal's algorithm to obtain minimum cost spanning tree for the following graph G.  	CO3	3	5 Marks
b) Find the optimal solution for knapsack problem where knapsack capacity m=40, n=3, (p1,p2,p3) =(50,48,30), (w1,w2,w3)=(36,30,20)	CO3	3	5 Marks
Q.4) Discuss the stable marriage problem. Consider the suitable data for example.	CO4	4	(10 marks)

OR			
Q.4) Apply maximum matching algorithm to the following bipartite graph.  	CO4	4	(10 marks)
Q.5) a) What is n-queen problem; write the solution of 8-queen problem by backtracking strategy b) Write short notes i) NP Complete Problem ii) Hamiltonian circuit	CO5	5	(20 marks)
OR			
Q.5) a) Write an algorithm for knapsack problem b) Write short notes i) Backtracking strategy ii) P, NP Problem	CO5	5	(20 marks)

End-Semester Assessment – Nov/Dec- 2024

Program : B.Sc (Cyber Security) Semester: III

Maximum Marks: 30 marks Time: 1.25 hrs.

Course Name: Foundation of Big Data **Course Code: UBS208A**

Course Outcomes (CO):

1. **List out the fundamentals of Big Data.**
2. **Classify the need and source of Big Data.**
3. **Illustrate the various technologies for managing Big Data.**
4. **Analyze the need for the Hadoop ecosystem.**
5. **Evaluate the different File System.**

Instructions:
- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CO	BL	Marks
Q1) Define Big Data, and why has it become a crucial aspect of modern business.	CO1	2	5 Marks
Q.2) Explain the challenges of data integration from multiple sources. What strategies can be employed to overcome these challenges?	CO2	2	5 Marks
Q.3) Examine a real-world case study of an organization that has successfully implemented cloud computing.	CO3	3	5 Marks
Q.4) Explain the purpose of additional modules in the Hadoop ecosystem, such as YARN and Hive.	CO4	2	5 Marks
OR			
Q.4) Explain the history of Hadoop from its inception to its current state.	CO4	2	5 Marks
Q.5) Explain how HDFS and MapReduce work together in the Hadoop ecosystem?	CO5	2	10 Marks
OR			
Q.5) Explain the architecture of the Hadoop Distributed File System (HDFS).	CO5	2	10 Marks

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SCHOOL OF SCIENCE

DEPARTMENT OF BSc (Cyber Security)

ACADEMIC YEAR: - 2024-25 (ODD SEM.)

Class Test-I Examination – August- 2024

Program : BSc (Cyber Security) **Batch :2023-26** **Semester: III**

Maximum Marks: 20 marks **Time: 1 Hr.**

Course Name: Design Analysis of Algorithm **Course Code : UBS201/MAJM**

Course Outcomes (CO):

1. Students will be able to define the various problem types and algorithms.
2. Explain a problem into two or more sub-problems of the same or related type.
3. Apply knowledge of different algorithm design techniques for a given problem.
4. Analyze different algorithm design techniques.
5. Examine the techniques to account for the true cost of the computation.

Instructions: 1. Solve any 4 questions from the given

2. Each Question carry equal marks

3. Draw the necessary diagram wherever necessary

Question	CO	BL	Marks
Q.1) Define the term Algorithm. List the key characteristics of algorithm along with importance of algorithm.	1	2	5 Marks
Q.2) What are the fundamentals of algorithmic problem solving	1	1	5 Marks
Q.3) What are the fundamentals of analysis of algorithmic efficiency	1	1	5 Marks
Q.4) Define the asymptotic notations. Prove the Big O notation by solving 3n+3 for all n>n0	1	2	5 Marks
Q.5) List out the factors to mathematical analysis of recursive algorithm with example	1	1	5 Marks

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DEPARTMENT OF BSc (Cyber Security)

ACADEMIC YEAR: - 2024-25(ODD SEM.)

Class Test-I Examination – August- 2024

Program : BSc (Cyber Security) **Batch :2023-26** **Semester: III**

Maximum Marks: 20 marks **Time: 1 Hr.**

Course Name: Web Application Security **Course Code : UBS203**

Course Outcomes (CO):

1. Identify the need of web Application Security.
2. Classify the different security mechanisms in web applications.
3. Use security principles to design a reliable web application.
4. Categorize the different attacks in web applications.
5. Designing a secure web application.

Instructions:

- **Answer any 4 out of the 5 questions provided.**
- **Each question carries equal marks.**
- **Where applicable, provide examples to support your answers.**

	Question	CO	BL	Marks
Q.1	Define web applications, their role and purpose?	1	I	5 M
Q.2	Explain the history of web applications and their evolution over time?	1	II	5 M
Q.3	Identify the drawbacks of web applications and how they can impact the users?	1	III	5 M
Q.4	Compare web applications and cloud applications based on different aspects?	1	IV	5 M
Q.5	Explain the importance of software security in web applications and the common methods used to recognize web application threats.	1	II	5 M

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DEPARTMENT OF BSc (Cyber Security)

ACADEMIC YEAR: - 2024-25(ODD SEM.)

Class Test-I Examination – August- 2024

Program: B.Sc. Computer Science (Cyber Security) **Batch: 2023-2027** **Semester: III**

Maximum Marks: 20 marks **Time: 1 Hr.**

Course Name: Security Assessment and Risk Analysis **Course Code: UBS206**

Course Outcomes (CO):

1. Define the core concepts of computer security.
2. Explain the design patterns of software design.
3. Illustrate the best practices for designing a secure software model.
4. Select the various data encryption mechanisms used in various businesses.
5. Simplify the need of having a secured development framework.

Instructions:

- **Solve any 4 questions**
- **Each question carries equal marks**
- **Wherever required draw neat diagram**

Question	CO	BL	Marks
Q.1) Explain computer security and its types?	CO1	1	5 Marks
Q.2) Describe the Threat Modeling Techniques?	CO1	1	5 Marks
Q.3) Why computer security is important?	CO1	1	5 Marks
Q.4) What is CIA?	CO1	2	5 Marks
Q.5) Explain any three cyber-attacks?	CO1	2	5 Marks

*********All the Best**********

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SCHOOL OF SCIENCE

DEPARTMENT OF BSc (Cyber Security)

ACADEMIC YEAR: - 2024-25 (ODD SEM.)

CLASS TEST-II EXAMINATION – OCTOBER- 2024

Program : BSc (Cyber Security) **Batch** : 2023-26 **Semester:** III

Maximum Marks: 20 marks **Date:** -14th October 2024 **Time:** 1 Hr.

Course Name: Design Analysis of Algorithm **Course Code :** UBS201/MAJM

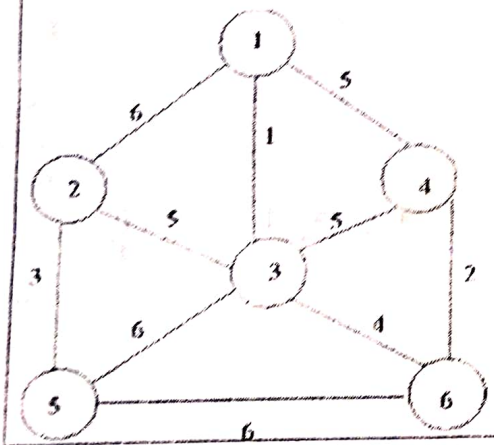
Course Outcomes (CO):

1. Students will be able to define the various problem types and algorithms.
2. Explain a problem into two or more sub-problems of the same or related type.
3. Apply knowledge of different algorithm design techniques for a given problem.
4. Analyze different algorithm design techniques.
5. Examine the techniques to account for the true cost of the computation.

Instructions: 1. Solve any 4 questions from given

2. Each Question carry equal marks

3. Draw the necessary diagram wherever necessary

Question	CO	BL	Marks
Q.1) What is Minimum cost spanning tree? Apply Kruskal's algorithm to obtain minimum cost spanning tree for the following graph. 19 	3	3	5
Q.2) Sorting the Array [10, 9, 8, 3, 1, 5, 11,7] using Quicksort	2	2	5
Q.3) Sort the Array [4, 10, 3, 5, 1] Using Heap Sort	2	3	5
Q.4) Find an optimal solution to the fractional knapsack problem instance, n = 7, m = 18, p = (12, 6, 15, 17, 6, 20, 3) and w = (2, 3, 5, 7, 2, 5, 1) 68.25	3	2	5
Q.5) What is Minimum cost spanning tree? Apply Prim's algorithm to obtain minimum cost spanning tree for the following graph. 16	3	3	5