Hall Ticket Number :

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R-20

Code: 20A56BT

III B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Cryptography and Network Security

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
        2. In Part-A, each question carries **Two marks.**
        3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		Marks	CO	BL
1.	Answer *all* the following short answer questions (5 X 2 = 10M)			
a)	Define security attacks.		CO1	L1
b)	What is Digital signature?		CO2	L1
c)	What is the purpose of X.509 standard?		CO3	L1
d)	What do you mean by Security Association? Specify the parameters that identifies the Security Association.		CO4	L1
e)	Define Intruders.		CO5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL

UNIT–I

		Marks	CO	BL
2.	Explain the OSI security architecture and its relevance in modern network security.	12M	CO1	L2

OR

		Marks	CO	BL
3.	Define attack surfaces and explain how they represent the points of vulnerability in a system or application.	12M	CO1	L1

UNIT–II

			Marks	CO	BL
4.	a)	Explain the fundamental principles of symmetric encryption.	6M	CO2	L2
	b)	How does symmetric encryption differ from asymmetric encryption, and what are its key advantages and limitations?	6M	CO2	L2

OR

		Marks	CO	BL
5.	In an RSA cryptosystem, a participant uses two prime numbers p = 3 and q = 11 to generate his public and private keys. If the private key is 7, then how will the text AITS be encrypted using the public key?	12M	CO2	L3

UNIT–III

		Marks	CO	BL
6.	Explain Kerberos authentication mechanism with suitable diagram?	12M	CO3	L2

OR

		Marks	CO	BL
7.	Explain the operational description of PGP.	12M	CO3	L2

UNIT–IV

		Marks	CO	BL
8.	Describe the SSL Architecture in detail	12M	CO4	L2

OR

		Marks	CO	BL
9.	Identify and explain the main participants involved in a Secure Electronic Transaction (SET) process.	12M	CO4	L2

UNIT–V

		Marks	CO	BL
10.	Explain any two approaches for intrusion detection.	12M	CO5	L2

OR

			Marks	CO	BL
11.	a)	What are the types of firewalls? Explain	7M	CO5	L2
	b)	Explain the characteristics of firewall.	5M	CO5	L2

*** End ***

R-20

Code: 20A30H09

III B.Tech. II Semester Honors Regular Examinations May/June 2024

Fundamentals of Systems Security

(Artificial Intelligence & Data Science)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
       2. In Part-A, each question carries **Two marks.**
       3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

				CO	BL
1.	Answer *all* the following short answer questions	(5 X 2 = 10M)			
	a)	What is meant by "Error 404: Hacking Digital India Part I Chase," and how might cybersecurity professionals respond to such a scenario?		CO1	L1
	b)	Define Intrusion Detection Systems (IDS).		CO2	L1
	c)	What is mean by browser isolation?		CO3	L1
	d)	Discuss the advantages and disadvantages of browser isolation techniques.		CO4	L6
	e)	What are the main threats to routing security in the internet?		CO5	L1

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL

UNIT–I

			Marks	CO	BL
2.		Explain two defense mechanisms against control hijacking attacks: platform defenses and run-time defenses.	12M	CO1	L2

OR

			Marks	CO	BL
3.	a)	Discuss the potential benefits or rewards associated with investing in computer security.	6M	CO1	L6
	b)	What are advanced control hijacking attacks, and how do they differ from traditional techniques? Provide examples.	6M	CO1	L1

UNIT–II

			Marks	CO	BL
4.	a)	How can attackers detour Unix user IDs, process IDs, and privileges to gain unauthorized access or privileges within a system?	6M	CO2	
	b)	Explain the confinement principle in VM-based isolation and its role in virtualization security.	6M	CO2	L2

OR

5. a) What is software fault isolation (SFI), and how does it mitigate the risks associated with untrusted code execution?   6M   CO2   L1

   b) Define rootkits and discuss their characteristics and potential impact on compromised systems.   6M   CO2   L1

UNIT–III

6. Compare and contrast the access control mechanisms used in Unix/Linux and Windows operating systems.   12M   CO3   L4

OR

7. Discuss the potential benefits and limitations of implementing browser isolation in enterprise environments.   12M   CO3   L6

UNIT–IV

8. Explain the concept of threat modeling in the context of web security.   12M   CO4   L2

OR

9. Describe how frames are used in web development and their security implications.   12M   CO4   L2

UNIT–V

10. Explain the concept of a packet filtering firewall.   12M   CO5   L2

OR

11. a) Differentiate between link layer connectivity and TCP/IP connectivity.   6M   CO5   L2

   b) Compare and contrast host-based and network-based intrusion detection systems (IDS).   6M   CO5   L4

*** End ***

R-20

Code: 20A3062T

III B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Machine Learning

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. In Part-A, each question carries **Two marks.**

3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

1. Answer **all** the following short answer questions   (5 X 2 = 10M)   CO   BL

a) Define what constitutes a well-posed learning problem in the context of machine learning.   CO1   L1

b) Identify two common issues encountered in decision tree learning.   CO2   L1

c) Define the minimum description length principle.   CO3   L1

d) Discuss two advantages of explanation-based learning (EBL).   CO4   L2

e) Discuss the concept of generalizing from examples in the context of reinforcement learning.   CO5   L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

                                                                          Marks   CO   BL

UNIT–I

2. a) Describe the Find-S algorithm for finding a maximally specific hypothesis consistent with the training data. Explain the iterative process of Find-S and how it progressively refines the hypothesis space based on observed examples.   6M   CO1   L2

   b) Consider a concept learning task where the attribute space consists of three binary attributes: A, B, and C. The training data is as follows:

   Example | A | B | C | Target Concept
   1 | 0 | 1 | 1 | Positive
   2 | 1 | 0 | 0 | Negative
   3 | 1 | 1 | 0 | Positive

   Apply the Find-S algorithm to find the maximally specific hypothesis.   6M   CO1   L3

OR

3. a) Define inductive bias in the context of machine learning and discuss its significance in guiding hypothesis search and generalization. Explore different forms of inductive bias.   6M   CO1   L2

b) Discuss the computational complexity of version spaces and candidate elimination and strategies for efficient hypothesis search in large hypothesis spaces.   6M   CO1   L2

UNIT–II

4. a) Consider a dataset with the following attributes (A, B, C) and target class (Positive or Negative):

Example

	A	B	C	Target
1	0	1	1	Positive
2	1	0	0	Negative
3	1	1	0	Positive

Calculate the information gain for each attribute (A, B, C) based on the target variable.   8M   CO2   L3

b) Describe the backpropagation algorithm for training multilayer neural networks.   4M   CO2   L2

OR

5. Given a feedforward neural network with one input layer (2 neurons), one hidden layer (3 neurons), and one output layer (1 neuron), and the following weights and biases:

Input Layer:

- Neuron 1: w1 = 0.5, w2 = 0.3, b1 = 0.2
- Neuron 2: w3 = 0.1, w4 = 0.4, b2 = -0.1

Hidden Layer:

- Neuron 1: w5 = 0.2, w6 = -0.3, b3 = 0.4
- Neuron 2: w7 = -0.1, w8 = 0.5, b4 = -0.2
- Neuron 3: w9 = 0.3, w10 = -0.2, b5 = 0.1

Output Layer:

- Neuron 1: w11 = 0.3, w12 = -0.1, b6 = 0.5

If the target output for a given input is 0.7, and the actual output of the network is 0.65, calculate the error gradients for each weight and bias using the backpropagation algorithm.   12M   CO2   L3

UNIT–III

6. a) Compare different models of evolution and learning used in GAs.   6M   CO3   L5

b) Explain strategies for parallelizing GAs to improve efficiency and scalability.   6M   CO3   L2

OR

7. a) Discuss how Bayes' theorem is applied in Bayesian learning to make predictions.   4M   CO3   L2

b) In a binary classification problem, the prior probability of the Positive class is 0.4. Given a training dataset with 80 instances, where 45 instances belong to the Positive class and 35 instances belong to the Negative class, calculate the maximum likelihood estimate of the class conditional probabilities
P(A=1|Positive) and P(A=1|Negative).   8M   CO3   L3

UNIT–IV

8. a) Discuss the FOIL (First-Order Inductive Learner) algorithm for learning sets of first-order rules.   6M   CO4   L2

   b) Compare FOIL with other rule learning algorithms in terms of efficiency and scalability.   6M   CO4   L5

OR

9. a) Explain the concept of sequential covering algorithms and their role in learning sets of rules.   6M   CO4   L2

   b) Describe the sequential covering process and how it iteratively refines rule sets to cover different instances in the dataset.   6M   CO4   L2

UNIT–V

10. a) Compare and contrast RL with traditional dynamic programming approaches   6M   CO5   L5

   b) Define TD learning and how it combines elements of dynamic programming.   6M   CO5   L3

OR

11. a) Describe the Q-learning algorithm and how it learns the value of state-action pairs.   6M   CO5   L3

   b) Explain how Q-learning updates Q-values based on observed rewards and future state-action values.   6M   CO5   L3

*** *End* ***

Hall Ticket Number :

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R-20

Code: 20A3061T

III B.Tech. II Semester Regular & Supplementary Examinations May / June 2024

Automata and Compiler Design

(Common to AI&DS and AI&ML)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

      2. In Part-A, each question carries **Two marks.**

      3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer **all** the following short answer questions (5 X 2 = 10M)   CO   BL

a) Design a DFA which accepts all strings that does not contain 3 consecutive 0's over input {0,1}   CO1   L3

b) Define a context free grammar?   CO2   L1

c) What is the difference between type conversion and type checking?   CO3   L1

d) What is dead code elimination?   CO4   L1

e) Describe the DAG (Directed Acyclic Graph) representation of a basic block.   CO5   L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

                                                                      Marks   CO   BL

UNIT–I

2. a) Construct DFA for the following: L={w | w has both an even number of 0's and even number of 1's }.   6M   CO1   L3

   b) Explain Chomsky hierarchy of languages and recognizers.   6M   CO1   L2

OR

3. a) Explain the minimization of DFA with its advantages and disadvantages.   6M   CO1   L3

   b) Define Regular expression. Explain the properties of Regular expressions   6M   CO1   L2

UNIT–II

4. Discuss the phases of compiler indicating the inputs and outputs of each phase in translating the statement

   "**amount = principle + rate *36.0**"   12M   CO2   L4

OR

5. a) Discuss about LL(K) grammars.   6M   CO2   L2

   b) Compute FIRST and FOLLOW for the following Grammar:

      S ABCD , A a/ , B CD/b , C C/ , D a/d/   6M   CO2   L5

UNIT–III

6. Construct SLR Parsing table for the grammar S L=R/R, L *R/id, R L   12M CO3 L5

OR

7. a) Provide an overview of YACC programming specification. How does YACC facilitate the implementation of parsers?

6M CO3 L3

   b) Differentiate between S-attributed and L-attributed grammars. Discuss their significance in syntax-directed translation   6M CO3 L4

UNIT–IV

8. a) Describe advantages of intermediate code. Discuss about three address code with examples   6M CO4 L2

   b) Explain the concept of Abstract Syntax Tree (AST). How is it constructed during intermediate code generation?   6M CO4 L1

OR

9. a) Examine the various storage allocation strategies.   6M CO4 L3

   b) Describe the organization of symbol tables. How are symbol tables used during compilation and runtime?   6M CO4 L3

UNIT–V

10. a) What are the principal sources of optimization in code? Discuss each source briefly.   6M CO5 L2

    b) Explain the process of data flow analysis of flow graphs. How is data flow analysis used to optimize code?   6M CO5 L2

OR

11. a) Discuss about Machine dependent code generation.   6M CO5 L4

    b) Construct the DAG for the following basic block:
       d : = b * c
       e : = a +b
       b : = b * c   L5
       a : = e – d   6M CO5

*** End ***

III B.Tech. II Semester Regular & Supplementary Examinations May/June 2024

Big Data Analytics
(Artificial Intelligence & Data Science)

Max. Marks: 70   Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A
(Compulsory question)

		CO	BL
1. Answer *all* the following short answer questions	(5 X 2 = 10M)		
a)	What is big data analytics? Mention applications of big data.	CO1	L1
b)	Define HDFS.	CO2	L1
c)	How map reduce works?	CO3	L1
d)	List out the two main difference between Hadoop and pig.	CO4	L4
e)	Difference between Hive and RDBMS.	CO4	L2

PART-B
Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	With the help of a neat diagram explain the organizations of resources in a big data platform.	6M	1	2
	b)	Explain core architecture of Hadoop with suitable block diagram.	6M	1	2
		OR			
3.		List various configuration files used in Hadoop Installation. What is use of mapred-site.xml?	12M	1	1
		UNIT–II			
4.	a)	Discuss and develop a MapReduce application.	6M	2	2
	b)	Write Java program copying a local to Hadoop file system.	6M	2	6
		OR			
5.		Explain the significance Hadoop distributed file systems and its applications.	12M	2	2
		UNIT–III			
6.		What is Map Reduce? Explain working of various phases of MapReduce with appropriate example and diagram.	12M	3	1, 2
		OR			
7.	a)	Discuss in detail about Shuffle and Sort.	6M	3	2
	b)	Describe the failures in classic in MapReduce.	6M	3	1
		UNIT–IV			
8.	a)	Explain in Hadoop Environment how the Cluster Setup and Installation.	6M	4	2
	b)	Write about the Pig user defined functions.	6M	4	1
		OR			
9.		Illustrate in briefly about installing and running pig.	12M	4	3
		UNIT–V			
10.	a)	Explain Spark components in detail. Also list the features of spark.	6M	5	2, 1
	b)	Explain working of Hive with proper steps and diagram.	6M	5	2
		OR			
11.	a)	Explain the HiveQL-Select-Order By with suitable example.	6M	5	2
	b)	Compare Hbase and HDFS.	6M	5	4

*** End ***