

Code: 20A3061T

III B.Tech. II Semester Regular Examinations June 2023

Automata and Compiler Design
(Artificial Intelligence & Data Science)

Max. Marks: 70

Time: 3 Hours

- 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) Contrast between Deterministic and Non-Deterministic Finite Automata | 1 | L3 |
| b) Comparison between Top down and Bottom up parser | 2 | L3 |
| c) Comparison between S-attribute grammar and L- attribute grammar | 3 | L3 |
| d) What is the significance of Symbol table | 4 | L2 |
| e) What is the significance of flow graph and data flow graph | 5 | L2 |

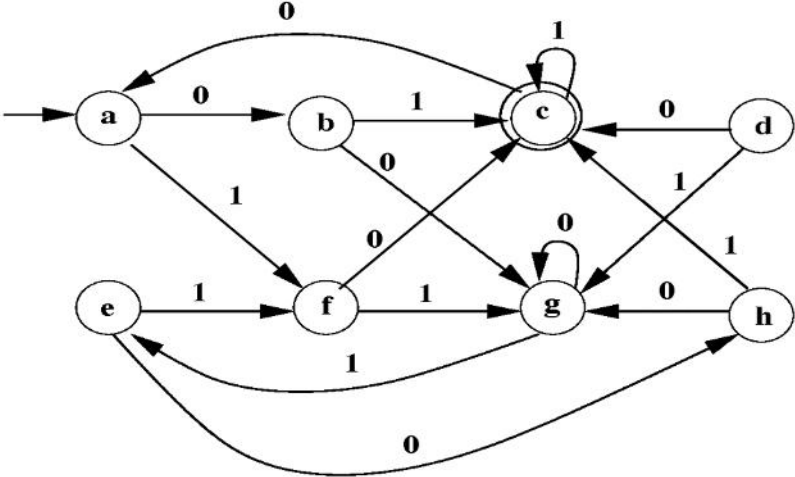
PART-B

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

Marks CO BL

UNIT-I

2. Construct equivalent minimum state DFA for the given automata.



12M 1 L4

OR

3. Construct NFA for $(a+b)^*aba(a+b)^*$ and convert to its equivalent DFA

12M 1 L4

UNIT-II

4. a) Explain the phases of Compilation with the help of an example.
 b) Discuss the role of Lexical Analyzer in detail

6M 2 L3

6M 2 L2

OR

5. a) Construct LR Parsing table for “dangling-else” grammar and parse the string “**iaea**”? 6M 2 L4
 b) Define Symbol table? Explain in detail various ways to implement the symbol table 6M 2 L2

UNIT-III

6. a) Construct SLR parsing table for the grammar
 $S \rightarrow AS/b$
 $A \rightarrow SA/a$ 6M 3 L4
 b) Comparison of SLR, LALR and CLR parsers? 6M 3 L3

OR

7. a) Write about overloading of functions and operations 6M 3 L3
 b) Consider the following grammar
 $S \rightarrow TL;$
 $T \rightarrow \text{int/float}$
 $L \rightarrow L, \text{id/id}$
 Parse the input string int id,id; using Shift-Reduce Parser 6M 3 L4

UNIT-IV

8. a) Interpret how variable length data and non-local data can be accessed in stack storage space allocation? 8M 4 L3
 b) Sketch Intermediate code for the following assignment?
 $x = c + a[i][j]$ 4M 4 L3

OR

9. Explain about storage allocation strategies 12M 4 L3

UNIT-V

10. a) Describe the principal sources of optimization? 6M 5 L2
 b) Explain the Peephole optimization technique? 6M 5 L3

OR

11. a) Create the target code using simple code generator algorithm on the below intermediate code?
 $t = a - b$
 $u = a - c$
 $v = t + u$
 $a = d$
 $d = v + u$ 6M 5 L4
 b) Write about DAG representation of basic block 6M 5 L3

*** End ***

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R-20

Code: 20A3063T

III B.Tech. II Semester Regular Examinations June 2023

Big Data Analytics

(Artificial Intelligence & Data Science)

Max. Marks: 70

Time: 3 Hours

- 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) What is big data? Write any five characteristics of big data. | CO1 | L1 |
| b) What is map reduce? | CO2 | L1 |
| c) List the types of InputFormat in MapReduce? | CO3 | L1 |
| d) How does the Pig platform handle relational systems data? | CO4 | L1 |
| e) Define the spark components? List the features of spark. | CO5 | L1 |

PART-B

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

Marks CO BL

UNIT-I

- | | | | |
|--|----|---|---|
| 2. a) Explain in detail about the evolution of Big data. | 6M | 1 | 2 |
| b) Discuss various components of Hadoop Ecosystem. | 6M | 1 | 2 |

OR

- | | | | |
|---|-----|---|---|
| 3. Demonstrate briefly about how the VMWare Installation of Hadoop. | 12M | 1 | 3 |
|---|-----|---|---|

UNIT-II

- | | | | |
|---|----|---|---|
| 4. a) Explain in detail about HDFS. | 6M | 2 | 2 |
| b) Illustrate working of various phases of Map Reduce with appropriate example and diagram. | 6M | 2 | 3 |

OR

- | | | | |
|--|----|---|---|
| 5. a) Describe in detail the concept of developing the map reduce applications. | 6M | 2 | 2 |
| b) Write a HDFS Java application example for reading, writing and deleting file from HDFS. | 6M | 2 | 1 |

UNIT-III

- | | | | |
|--|----|---|---|
| 6. a) Explain about InputFormat hierarchy. | 6M | 3 | 2 |
| b) Describe the failures in classic MapReduce. | 6M | 3 | 1 |

OR

- | | | | |
|--|----|---|---|
| 7. a) Explain briefly about MapReduce types and formats. | 6M | 3 | 2 |
| b) Describe about anatomy of file read with neat sketch. | 6M | 3 | 2 |

UNIT-IV

- | | | | |
|--|-----|---|-----|
| 8. Illustrate in Hadoop Environment explain neatly cluster setup and Installation. | 12M | 4 | 2,3 |
|--|-----|---|-----|

OR

- | | | | |
|--|----|---|---|
| 9. a) Explain in detail a of Pig Latin Build-in-functions. | 6M | 4 | 2 |
| b) Illustrate benchmarking a Hadoop Cluster. | 6M | 4 | 2 |

UNIT-V

- | | | | |
|--|-----|---|------|
| 10. What do you mean by HiveQL Data Definition Language? Explain any three HiveQL DDL command with its syntax and example. | 12M | 5 | 1, 2 |
|--|-----|---|------|

OR

- | | | | |
|--|----|---|---|
| 11. a) Explain briefly about Anatomy of a Spark Job Run. | 6M | 5 | 2 |
| b) Discuss about HBase Architecture. | 6M | 5 | 2 |

*** End ***

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R-20

Code: 20A56BT

III B.Tech. II Semester Regular Examinations June 2023

Cryptography and Network Security

(Common to CSE and AI&DS)

Max. Marks: 70

Time: 3 Hours

- 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 active and passive attack with an example. | CO1 | L2 |
| b) Use Caesar cipher with key =15 to encrypt the message "Hello". | CO2 | L2 |
| c) Write the authentication dialogue exchanged between user and authentication server in Kerberos V4? | CO3 | L1 |
| d) List the five header fields and their meaning defined in MIME. | CO4 | L1 |
| e) What are the various categories of 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

- | | | | |
|--|----|-----|----|
| 2. a) What is the relation between security mechanisms and attacks? Explain. | 6M | CO1 | L2 |
| b) Write the requirements of cryptography? | 6M | CO1 | L1 |

OR

- | | | | |
|---|----|-----|----|
| 3. a) Explain the fundamental security design principles. | 6M | CO1 | L2 |
| b) Discuss about Attack surfaces and Attack trees. | 6M | CO1 | L1 |

UNIT-II

- | | | | |
|---|----|-----|----|
| 4. a) Explain in detail about DES and Triple DES. | 6M | CO2 | L2 |
| b) Discuss the discrete logarithm and explain Diffie-Hellman Key exchange algorithm with its merits and demerits. | 6M | CO2 | L2 |

OR

- | | | | |
|---|----|-----|----|
| 5. a) Explain about the key generation in AES algorithm | 6M | CO2 | L2 |
| b) Users A & B exchange the key using Diffie-Hellman algorithm. Assume $p=5$, $q=83$, $X_A=6$, $X_B=10$. Find Y_A , Y_B , K . | 6M | CO2 | L2 |

UNIT-III

6. a) What are the content types provided by S/MIME? Explain. 6M CO3 L1
 b) Explain about the trust mechanism and certificates used by PGP and S/MIME. 6M CO3 L2

OR

7. a) Explain the sequence of steps involved in the message generation and reception in Pretty Good Privacy (PGP) with block diagrams. 6M CO3 L2
 b) How is an enveloped data MIME entity prepared? Write the steps. 6M CO3 L2

UNIT-IV

8. a) Illustrate the relevance of dual signature in SET. 6M CO4 L1
 b) Explain the four protocols defined by Secure Socket Layer. 6M CO4 L1

OR

9. a) What are the services provided by IPSec? Where the IPSec can be located on a network? 6M CO4 L1
 b) Briefly discuss about Oakley key determination protocol. 6M CO4 L1

UNIT-V

10. a) What is an audit record? What is the use of audit record in intrusion detection? 6M CO5 L2
 b) Explain the types of Host based intrusion detection. List any two IDS software available. 6M CO5 L2

OR

11. a) Explain the various measures that may be used for intrusion detection. 6M CO5 L2
 b) Define firewall? Explain different types of firewalls. 6M CO5 L2

*** End ***

Hall Ticket Number :									
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R-20

Code: 20A3062T

III B.Tech. II Semester Regular Examinations June 2023

Machine Learning
(Common to CSE and AI&DS)

Max. Marks: 70

Time: 3 Hours

- 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) What is hypothesis? | | CO1 | L1 |
| b) Distinguish the sigmoid and Relu activation functions. | | CO2 | L2 |
| c) State the purpose of Maximum A Posteriori hypothesis. | | CO3 | L1 |
| d) Define chunking in explanation based learning. | | CO4 | L1 |
| e) What is the need of bellman equation in reinforcement learning? | | CO5 | L1 |

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 design of learning system with suitable example. | 8M | CO1 | L1 |
| b) Find the Task, Performance, and Experience of robot driving learning system. | 4M | CO1 | L2 |

OR

3. a) Apply FIND-S algorithm on the given dataset to find the final hypothesis?

Session	Climate	Temp	Park	Humidity	Wind	Go for jogging
Morning	Sunny	Warm	Yes	Mild	Strong	Yes
Evening	Rainy	Cold	No	Mild	Normal	No
Morning	Sunny	Moderate	Yes	Normal	Normal	Yes
Evening	Sunny	Cold	Yes	High	Strong	Yes

8M CO1 L3
4M CO1 L2

- b) Differentiate the hypothesis space and version space.

UNIT-II

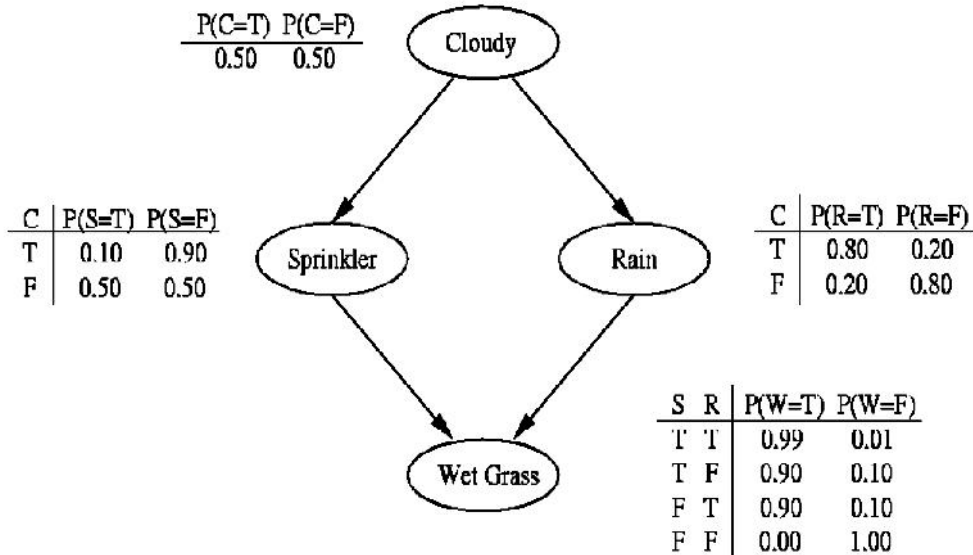
- | | | | |
|--|----|-----|----|
| 4. a) Sketch the structure of decision tree with example. Explain in detail. | 4M | CO2 | L3 |
| b) How does parameters update in artificial neural network? Illustrate the diagram with three parameters w_1 , w_2 , and b_1 . | 8M | CO2 | L4 |

OR

5. a) Describe the characteristics of decision tree learning. 4M CO2 L2
 b) Apply ANN to compute the output for the given inputs $x_1 = 0.7$, $x_2 = 0.2$, and parameters $w_1=0.8$, $w_2=0.1$, and $b_1=0.5$ using sigmoid activation function. 8M CO2 L3

UNIT-III

6. a) How can reduce the crowding in genetic algorithm application? 4M CO3 L2
 b)



Calculate the probability of grass is wet during climate is cloudy?

8M CO3 L3

OR

7. a) Describe the Gibbs algorithm. 4M CO3 L2
 b) Apply the Genetic algorithm to find optimal hypothesis in hypothesis space with necessary steps. 8M CO3 L3

UNIT-IV

8. a) List the key properties of PROLOG-EBG algorithm. 6M CO4 L1
 b) Implement first order Horn Clause learning to find the target concept. 6M CO4 L3

OR

9. a) Explain the PRODIGY learner in explanation-based learning. 8M CO4 L2
 b) How does specific hypothesis found using PROGOL? 4M CO4 L2

UNIT-V

10. a) Describe the implementation of Q-learning in non-deterministic environment. 4M CO5 L2
 b) Illustrate the markov decision process to formulate the sequential states learning. 8M CO5 L3

OR

11. a) Describe about the temporal difference learning. 4M CO5 L1
 b) Explain an algorithm for learning Q with example. 8M CO5 L2

*** End ***