

Hall Ticket Number :

R-20

Code: 20A55DT

III B.Tech. I Semester Regular &amp; Supplementary Examinations December 2023

**Principles of Programming Languages**

(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)**

- |   |    |    |
|---|----|----|
| 1. Answer <b>all</b> the following short answer questions ( 5 X 2 = 10M ) | CO | BL |
| a) List different language categories.                                    | 1  | L1 |
| b) Recall the definition of parse tree                                    | 2  | L1 |
| c) Explain the concept conditional statement                              | 3  | L2 |
| d) Derive exception handling  | 4  | L6 |
| e) Illustrate importance of LISP  | 5  | L4 |

**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 importance of object oriented and functional programming language | 6M | 1 | 1 |
| b) Explain importance BNF, EBNF with an example and its role                         | 6M | 1 | 3 |

**OR**

- |   |    |   |   |
|---|----|---|---|
| 3. a) Illustrate different data types used in object oriented language              | 6M | 1 | 1 |
| b) Explain semantic and pragmatic tradeoffs among the various programming paradigms | 6M | 1 | 3 |

**UNIT-II**

- |  |    |   |   |
|--|----|---|---|
| 4. a) Apply various data type to give details about a teacher.           | 6M | 2 | 3 |
| b) Illustrate a program using a constant and variable and its importance | 6M | 2 | 1 |

**OR**

- |   |    |   |   |
|---|----|---|---|
| 5. a) Describe routines and co routines with an example | 6M | 2 | 2 |
| b) Describe the types of arithmetic expressions         | 6M | 2 | 2 |

**UNIT-III**

- |   |    |   |   |
|---|----|---|---|
| 6. a) Apply the looping statement to print 1 to 10 numbers.<br>(using any language) | 6M | 3 | 3 |
| b) Summarize the importance of different types of variables.                        | 6M | 3 | 3 |

**OR**

- |  |    |   |   |
|--|----|---|---|
| 7. a) Use a static variable in a program to calculate the area of a circle | 6M | 3 | 3 |
| b) Demonstrate the importance of scope of a variable                       | 6M | 3 | 3 |

**UNIT-IV**

- |   |    |   |   |
|---|----|---|---|
| 8. a) Create an example with try and catch block in a C++ program | 6M | 4 | 6 |
| b) Formulate the importance of exception handler with example     | 6M | 4 | 6 |

**OR**

- |   |    |   |   |
|---|----|---|---|
| 9. a) Formulate an example to show the data abstraction and list its importance | 6M | 4 | 6 |
| b) Write a program to display student details using C++                         | 6M | 4 | 6 |

**UNIT-V**

- |  |    |   |   |
|--|----|---|---|
| 10. a) Classify data types in imperative language  | 6M | 5 | 4 |
| b) Outline the application of prolog with examples | 6M | 5 | 4 |

**OR**

- |  |    |   |   |
|--|----|---|---|
| 11. a) Illustrate Haskell importance in industry | 6M | 5 | 4 |
| b) Classify the types of application of prolog   | 6M | 5 | 4 |

\*\*\* End \*\*\*

Hall Ticket Number :

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Code: 20A553T

III B.Tech. I Semester Regular &amp; Supplementary Examinations December 2023

**Software Engineering**

(Common to CSE, AI&amp;DS and AI&amp;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 <b>all</b> the following short answer questions ( 5 X 2 = 10M )                  | CO | BL |
| a) What is software engineering, and why is it essential in the field of computer science? | 1  | 1  |
| b) Discuss the main components of a use case diagram in UML                                | 2  | 2  |
| c) What is the component level design  | 3  | 1  |
| d) What is debugging? Describe art of debugging.   | 4  | 1  |
| e) How is staffing level estimation performed in software project management               | 5  | 2  |

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

Marks CO BL

**UNIT-I**

- |   |    |   |   |
|---|----|---|---|
| 2. a) How can personal and team process models be beneficial in a software development project? | 6M | 1 | 2 |
| b) Explain the concept of process assessment and improvement.                                   | 6M | 1 | 2 |

**OR**

- |  |     |   |   |
|--|-----|---|---|
| 3. Briefly discuss about Prescriptive process models | 12M | 1 | 2 |
|--|-----|---|---|

**UNIT-II**

- |   |    |   |   |
|---|----|---|---|
| 4. a) Explain the significance of a Software Requirement Specification (SRS).   | 6M | 2 | 2 |
| b) Explain the concept of CRC cards and how they are used in software modeling. | 6M | 2 | 3 |

**OR**

- |  |    |   |   |
|--|----|---|---|
| 5. a) What are some effective strategies for negotiating requirements with stakeholders? | 6M | 2 | 2 |
| b) Demonstrate Scenario-Based Modeling.  | 6M | 2 | 3 |

**UNIT-III**

6. Describe the fundamental design concepts that guide the creation of software solutions. 12M 3 2

**OR**

7. Explain the concept of architectural styles in software design. 12M 3 2

**UNIT-IV**

8. What are the key steps involved in user interface design? 12M 4 4

**OR**

9. a) What is Black-Box Testing and White-Box Testing? Compare them. 6M 4 4

- b) What are program analysis tools, and how can they aid in identifying software defects? 6M 4 4

**UNIT-V**

10. a) Describe different metrics used for project size estimation. 6M 5 2

- b) Illustrate software quality and software reliability 6M 5 2

**OR**

11. What is Capability Maturity Model explain different levels? 12M 5 2

\*\*\* End \*\*\*

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**Code: 20A551T**

III B.Tech. I Semester Regular & Supplementary Examinations December 2023

## Artificial Intelligence

(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)

- |  |     |    |
|--|-----|----|
| 1. Answer <b>all</b> the following short answer questions ( 5 X 2 = 10M )                                    | CO  | BL |
| a) Explain the historical development of Artificial Intelligence (AI) and how it has evolved over the years. | CO1 | L2 |
| b) Define a "Heuristic Function" in the context of informed search methods.                                  | CO2 | L1 |
| c) Define a "Knowledge-Based Agent"  | CO3 | L1 |
| d) What is partial order planning?   | CO4 | L1 |
| e) Define Uncertainty in the context of knowledge representation and reasoning                               | 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 the concept of "Problem Representation as State Space Search" in the context of intelligent agents. Define the components of a state space search            | 6M | CO1 | L2 |
| b) Provide an example of a problem that can be represented as a state space search problem and discuss how problem characteristics impact the choice of search algorithms. | 6M | CO1 | L5 |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 3. a) Briefly explain the emergence of intelligent agents in the field of Artificial Intelligence.                         | 6M | CO1 | L2 |
| b) Explain the concept of a rational agent and its significance in AI systems. Provide examples to illustrate your points. | 6M | CO1 | L4 |

### UNIT-II

- |   |     |     |    |
|---|-----|-----|----|
| 4. Compare and contrast Depth-First Search (DFS) and Breadth-First Search (BFS) as uninformed search techniques. Provide examples to illustrate their differences and applications. | 12M | CO2 | L5 |
|---|-----|-----|----|

**OR**

- |  |     |     |    |
|--|-----|-----|----|
| 5. Compare and contrast Hill Climbing, Simulated Annealing, and the A* algorithm as informed search methods. Provide examples to demonstrate how they work and when each is most suitable. | 12M | CO2 | L5 |
|--|-----|-----|----|

<b>UNIT-III</b>
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6. a) Discuss the importance of knowledge representation and reasoning in the context of knowledge-based agents. Provide examples to illustrate how these agents operate and make decisions. 8M CO3 L5
- b) Explore the concept of "Unification" in the context of logic-based AI. Describe how unification works and its importance in various aspects of logic 4M CO3 L2

**OR**

7. a) Discuss the concept of "Resolution". Explain how resolution is used to derive conclusions and solve logical problems. 6M CO3 L5
- b) Provide practical examples to illustrate the unification process and its role in solving problems. 6M CO3 L6

<b>UNIT-IV</b>
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8. a) Explain the role of ontology in organizing knowledge and providing a structured representation of concepts. 6M CO4 L2
- b) Discuss "Conditional Planning" and its significance in AI. Explain how conditional planning differs from traditional planning approaches and how it handles dynamic environments. 6M CO4 L5

**OR**

9. a) Examine "Partial Order Planning" as a planning technique in AI. Describe the principles behind partial order planning and its application in solving planning problems. 4M CO4 L1
- b) Discuss the key challenges associated with planning in an environment with partial information and uncertainty. Provide examples to demonstrate how state space search can be applied to address such challenges. 8M CO4 L5

<b>UNIT-V</b>
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10. a) Discuss the concept of "Belief Networks" in probabilistic reasoning. 6M CO5 L5
- b) Provide an example of a belief network and walk through the process of performing inference using the network. 6M CO5 L4

**OR**

11. a) Explain "Fuzzy Logic" as a method of handling uncertainty. 6M CO5 L2
- b) Compare fuzzy logic with classical binary logic and provide examples where fuzzy logic is particularly advantageous. 6M CO5 L2

\*\*\* End \*\*\*

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**Code: 20A552T**

III B.Tech. I Semester Regular & Supplementary Examinations December 2023

# **Computer Networks**

(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 <b>all</b> the following short answer questions ( 5 X 2 = 10M )   | CO  | BL |
| a) How many layers are present in OSI and TCP/IP reference models? Which of the layers in OSI are bundled together in TCP/IP reference stack?           | CO1 | L1 |
| b) What is meant by 'collision'? How does the DLL resolve this issue?   | CO2 | L1 |
| c) Among the IP addresses: 192.168.1.10 and 17.5.7.8, which of them is public/private? Justify your answer.   | CO3 | L5 |
| d) State a few example applications that would require TCP and few others that would require UDP protocols at transport layer with a logical reasoning. | CO4 | L2 |
| e) What does the term TTL mean in the resource record field of DNS? How many bytes constitute this field?   | CO5 | L1 |

## **PART-B**

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

Marks	CO	BL
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### **UNIT-I**

- |   |    |     |    |
|---|----|-----|----|
| 2. a) List the layers of OSI reference model with description on the functionalities of each layer.         | 8M | CO1 | L1 |
| b) Among the wired and wireless channels, which one of them offers fast communication? Justify your answer. | 4M | CO1 | L2 |

**OR**

- |   |    |     |    |
|---|----|-----|----|
| 3. a) Classify the types of network in terms of their size. Apart from the end point devices that constitute computer networks, what are the other devices that help internetworking? | 6M | CO1 | L1 |
| b) Compare and contrast between the twisted pair wires and optical fiber cable as guided media for computer communications.   | 6M | CO1 | L2 |

### **UNIT-II**

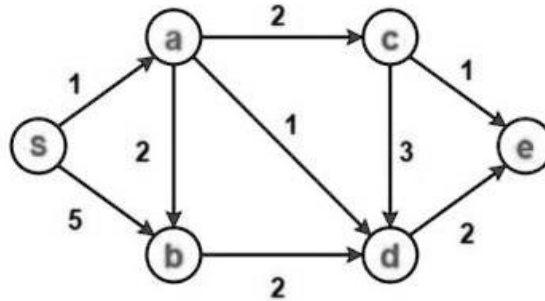
- |   |    |     |    |
|---|----|-----|----|
| 4. a) What are the sources of errors on the communication channels? Mention any two standard techniques by which bit errors can be detected or corrected. | 6M | CO2 | L1 |
| b) Specify the objectives of Go-Back-N protocol and illustrate the functioning of this protocol with a neat sketch of a timing diagram.                   | 6M | CO2 | L2 |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 5. a) Distinguish between collision detection and collision avoidance techniques.  | 6M | CO2 | L1 |
| b) Explain the functioning of IEEE 802.x protocols for various network topologies. | 6M | CO2 | L2 |

UNIT-III

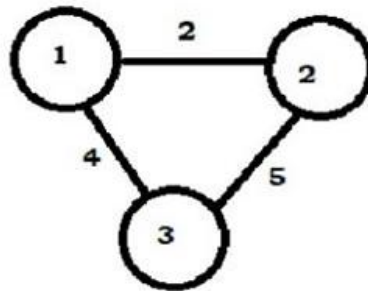
6. a) What are the objectives of the network layer? Mention any three widely used shortest path algorithms. 4M CO3 L2
- b) Compute the routing table for node S using any one of the shortest path algorithms for the network as shown below where the numbers on edges indicate the cost metric.



8M CO3 L5

OR

7. a) Define the terms unicast, multicast and broadcast. 4M CO3 L1
- b) How does Distance Vector Routing differ from that of Link State Routing? Determine the routing table for all the three nodes for the following network graph using distance vector routing.



8M CO3 L4

UNIT-IV

8. a) What are the factors that affect the reliability of the end-to-end communications? How does the transport layer help maximizing reliability? 6M CO4 L2
- b) Distinguish between TCP and UDP giving suitable examples. 6M CO4 L3

OR

9. a) Draw a neat sketch of TCP header format and explain the use of various fields in it. 6M CO4 L2
- b) What are the types of IP addresses? Give suitable examples giving the range of such IP addresses. 6M CO4 L3

UNIT-V

10. a) Define the term URL and explain the process of clients getting resolved the IP addresses of the corresponding URLs. 6M CO5 L2
- b) What are TCP/UDP 'ports'? Give standard port numbers for the following services: http; snmp; smtp; tcp 6M CO5 L3

OR

11. a) Write brief notes on the client-server model. 6M CO5 L2
- b) Describe the functioning of hypertext transfer protocol and its use in world wide web. 6M CO5 L2

\*\*\* End \*\*\*



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**Code: 20A5H01**

III B.Tech. I Semester (Honors) Regular Examinations December 2023

**DevOps**

(Common 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 <b>all</b> the following short answer questions ( 5 X 2 = 10M )  | CO  | BL |
| a) How DevOps is different from agile methodology?   | CO1 | L1 |
| b) What is the primary goal of the DevOps lifecycle in enhancing business agility?<br>Provide two key stages in the DevOps process that contribute to achieving this goal. | CO2 | L2 |
| c) Briefly define what a project code is. Provide one example of a key role and a project code   | CO3 | L1 |
| d) Name two key features of Jenkins that enhance the efficiency of the build server.   | CO4 | L1 |
| e) Why are there so many deployment systems? Explain?  | 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. Discuss the core principles and key components of ITIL (Information Technology Infrastructure Library) in detail. Provide examples of how ITIL practices can improve IT service management within an organization. Additionally, elaborate on the challenges that organizations might face when implementing ITIL and suggest potential strategies to overcome these challenges. 12M CO1 L2

**OR**

3. Examine the significance of Release Management in the context of DevOps, outlining the key principles and processes involved. Discuss how effective Release Management contributes to the overall success of a DevOps implementation, citing specific examples 12M CO2 L3

**UNIT-II**

4. Describe Devops architecture and resilience in detail? 12M CO2 L2

**OR**

5. Write short note on software architecture. Explain about the monolithic scenario? 12M CO2 L1

**UNIT-III**

6. How does a Source Code Management (SCM) system facilitate code migrations in software development? Explain in detail. 12M CO3 L2

**OR**

7. What are the key distinctions between various Git server implementations and their impact on collaborative software development? 12M CO3 L2

**UNIT-IV**

8. Discuss the critical aspects of managing build dependencies in software development, covering the challenges, strategies, and tools involved. Provide real-world examples illustrating the importance of effective dependency management, and outline how improper handling can impact the overall build process. 12M CO4 L3

**OR**

9. Discuss the advantages of using build pipelines and job chaining for software development. Provide a step-by-step explanation of how these practices contribute to a streamlined development process. 12M CO4 L2

**UNIT-V**

10. Write short on:  
a) Deploying with saltstack  
b) Testing backend integration points 12M CO5 L1

**OR**

11. Write short on:  
a) Virtualization stacks  
b) Advanced Integration Testing 12M CO5 L1

\*\*\* End \*\*\*