Department of Computer Science and Engineering

III Year VI Semester

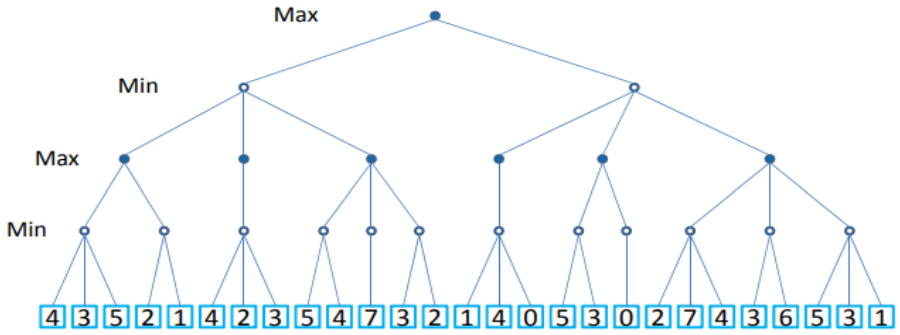
6CS4-05: Artificial Intelligence

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q.1 Explain Artificial Intelligence in details and also its type?	BLT-2	CO-1
Q.2 Describe the different approaches of Artificial Intelligence?	BLT-3	CO-1
Q.3 Detailed explain the applications of artificial Intelligence?	BLT-2	CO-1
Q.4 Explain the conditions under which BFS is optimal and its limitations.		

ASSIGNMENT-II

Q.1. Define following terms:- a) Game Playing b) Alpha Pruning	BLT-2	CO-2
Q.2. Briefly explains min – max algorithm and compared the value of all turns. 	BLT-5	CO-2
Q.3. Define tiles problem with suitable example.	BLT-1	CO-2
Q.4 What is alpha-beta pruning strategy. Explain its need.	BLT-1	CO-2
Q.5 Explain production system. Explain the elements of production system and also explain the characteristics of production system.	BLT-2	CO-2

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III Year VI Semester

6CS4-05: Artificial Intelligence

ASSIGNMENT-III

Q.1. Describe the term a) Predicate logic. b) Situation Calculus	BLT-2	CO-3
Q.2 Explain Non-monotonic resoning and discuss various logic associated with it?	BLT-2	CO-3
Q.3. Explain the difference b/w propositional and predicate logic?	BLT-4	CO-3
Q.4 Explain Baye's Theorem/Bayesian networks and what is mean by conditional probability?	BLT-2	CO-3
Q.5 What is situation calculus? Why are representations important in artificial intelligence?	BLT-1	CO-3

ASSIGNMENT-IV

Q.1 How "learning by example" is different from learning by taking advice? Explain it giving suitable example.	BLT-4	CO-4
Q.2 Discuss winston's learning program?	BLT-1	CO-4
Q.3 Discuss the following terms: - 1) Learning in problem solving. 2) Learning from example. 3) Explanation Based Learning	BLT-2	CO-4
Q.4 What do you mean by learning? Explain any one technique which is used in learning?	BLT-2	CO-4
Q.5 Explain supervised and un-supervised learning in details.	BLT-2	CO-4

ASSIGNMENT-V

Q.1 Define natural language processing? Explain with example.	BLT-1	CO-5
Q.2 What are the issues of common sense?	BLT-1	CO-5
Q.3 Explain expert system? Explain "MYCIN" in-depth with block diagram.	BLT-2	CO-5
Q.4. What is Robotics?	BLT-1	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Computer Science and Engineering

III Year VI Semester

6CS4-04: Computer Architecture and Organization

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q 1. Explain the concept of fixed-point representation in computer data representation. Compare and contrast it with floating-point representation, highlighting their respective advantages and disadvantages.	BLT-2	CO-1
Q 2. Describe the role of micro-operations in computer architecture. Discuss arithmetic, logic, and shift micro-operations in detail, including their purpose and implementation	BLT-2	CO-1
Q 3. Discuss the design considerations involved in implementing an arithmetic logical shift unit. Explain how such a unit operates and how it differs from a simple logical shift unit.	BLT-1	CO-1
Q 4. Define register transfer language (RTL) and its significance in computer architecture. Provide examples of RTL instructions and explain how they are used to describe micro-operations and register transfers.	BLT-1	CO-1
Q 5. Design a basic computer system, including the instruction set architecture (ISA), instruction codes, computer registers, and control unit. Describe how the components interact during the instruction cycle and memory-reference instructions execution. Additionally, discuss the role of input-output and interrupt handling in the overall system design.	BLT-6	CO-1

ASSIGNMENT-II

Q 1. Explain the difference between machine language and assembly language. Discuss the advantages and disadvantages of programming in each language, and provide examples of instructions in both.	BLT-2	CO-2
Q 2. Describe the role of an assembler in the context of programming the basic computer. Explain how it translates assembly language instructions into machine code. Provide an example of a simple assembly language program and its corresponding machine code.	BLT-4	CO-2
Q 3. Discuss the concept of program loops in programming the basic computer. Explain how loop structures are implemented using conditional and unconditional branch instructions. Provide examples of loop constructs in assembly language.	BLT-2	CO-2
Q 4. Explain how arithmetic and logic operations are programmed in the basic computer. Provide examples of assembly language instructions for addition, subtraction, AND, OR, and NOT operations. Discuss how these operations are performed at the machine level.	BLT-3	CO-2
Q 5. Describe the concept of subroutines in programming the basic computer. Explain how subroutines are implemented using branch instructions and the stack. Discuss the advantages of using subroutines for modular programming. Provide an example of a subroutine in assembly language and discuss its implementation.	BLT-3	CO-2

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III Year VI Semester

6CS4-04: Computer Architecture and Organization

ASSIGNMENT-III

Q 1. Discuss the significance of general register organization in the CPU. Explain the role of different types of registers such as accumulator, index registers, and stack pointers. Provide examples illustrating how these registers are utilized in typical instruction execution.	BLT-2	CO-3
Q 2. Explain the stack organization in the context of CPU architecture. Describe how the stack is used for storing temporary data and managing subroutine calls. Discuss the stack pointer register and the process of pushing and popping data onto and from the stack.	BLT-1	CO-3
Q 3. Describe the different instruction formats commonly used in CPU architectures. Discuss the advantages and disadvantages of various instruction formats such as fixed-length, variable-length, and hybrid formats. Provide examples of instructions for each format.	BLT-2	CO-3
Q 4. Explore the various addressing modes used in CPU instruction sets. Explain the concepts of direct addressing, indirect addressing, indexed addressing, and relative addressing. Provide examples of assembly language instructions demonstrating each addressing mode.	BLT-4	CO-3
Q 5. Discuss the principles of reduced instruction set computer (RISC) architecture. Explain how RISC CPUs differ from complex instruction set computers (CISC) in terms of instruction set design, pipeline execution, and performance optimization. Compare and contrast RISC and CISC architectures, highlighting the advantages and disadvantages of each approach.	BLT-3	CO-3

ASSIGNMENT-IV

Q 1. Explain the fundamental concepts of computer arithmetic. Discuss the importance of accurate arithmetic operations in digital computing. Provide examples illustrating the significance of arithmetic operations in practical computing tasks.	BLT-2	CO-4
Q 2. Describe the algorithms used for addition and subtraction in computer arithmetic. Discuss the basic principles behind binary addition and subtraction. Provide examples demonstrating the step-by-step execution of addition and subtraction algorithms.	BLT-4	CO-4
Q 3. Explain the Booth Multiplication Algorithm used for binary multiplication in computer arithmetic. Discuss the advantages of Booth's algorithm over traditional multiplication methods. Provide a detailed example illustrating the execution of Booth's algorithm for binary multiplication.	BLT-4	CO-4
Q 4. Discuss the different algorithms used for division in computer arithmetic. Explain the principles behind techniques such as restoring division and non-restoring division. Compare and contrast the performance of these algorithms in terms of speed and complexity. Provide examples demonstrating the division process using each algorithm.	BLT-5	CO-4
Q 5. Explore the principles of floating-point arithmetic operations in computing. Explain how floating-point numbers are represented and manipulated in digital systems. Discuss the challenges associated with floating-point arithmetic, such as rounding errors and precision limitations. Provide examples illustrating the addition, subtraction, multiplication, and division of floating-point numbers.	BLT-3	CO-4

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III Year VI Semester

6CS4-04: Computer Architecture and Organization

ASSIGNMENT-V

Q 1.Discuss the concept of memory hierarchy in computer systems. Explain the purpose of main memory, auxiliary memory, and cache memory in the memory hierarchy. Compare and contrast the characteristics of each memory level in terms of speed, size, and cost. Provide examples illustrating the role of memory hierarchy in improving overall system performance.	BLT-3	CO-5
Q 2.Explain the principles of main memory organization in computer architecture. Discuss the structure of main memory modules, including RAM (Random Access Memory) and ROM (Read-Only Memory). Describe the addressing scheme used to access memory locations in main memory. Provide examples demonstrating the memory read and write operations.	BLT-4	CO-5
Q 3.Describe the role of associative memory in computer systems. Explain how associative memory differs from traditional main memory in terms of organization and access mechanism. Discuss the advantages and limitations of associative memory. Provide examples illustrating the use of associative memory in real-world applications.	BLT-4	CO-5
Q4. Discuss the principles of cache memory in computer architecture. Explain how cache memory improves CPU performance by reducing memory access latency. Describe the different cache mapping techniques, including direct mapping, set-associative mapping, and fully associative mapping. Provide examples demonstrating the cache read and write operations.	BLT-3	CO-5
Q 5. Explain the concept of virtual memory in computer systems. Discuss the principles behind virtual memory management, including demand paging, page replacement algorithms, and address translation. Describe the benefits of virtual memory in terms of memory utilization and process management. Provide examples illustrating the use of virtual memory in modern operating systems.	BLT-2	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

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III Year VI Semester

6CS4-06: Cloud Computing

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q 1. What is Cloud Computing?	BLT-1	CO-1
Q 2. Define Cloud Enabling Technology in detail?	BLT-1	CO-1
Q 3.Explain Components of Cloud Computing?	BLT-2	CO-1
Q 4. Explain Risks and Approaches of Migration into Cloud?	BLT-2	CO-1
Q 5. Evaluating the Cloud's Business Impact and economics?	BLT-4	CO-1

ASSIGNMENT-II

Q 1. Define Cloud Reference Model?	BLT-1	CO-2
Q 2.Explain Architectural design of Compute and Storage Clouds?	BLT-2	CO-2
Q 3.Define Cloud Programming and Software: Features of cloud programming .	BLT-1	CO-2
Q 4. Explain Programming of Google App engine?	BLT-2	CO-2
Q 5. Parallel and distributed programming paradigms-MapReduce?	BLT-4	CO-2

ASSIGNMENT-III

Q 1. Define Understanding and Benefits of Virtualization?	BLT-1	CO-3
Q 2. Explain Implementation Level of Virtualization?	BLT-2	CO-3
Q 3. Define Virtualization Structure/Tools and Mechanisms?	BLT-1	CO-3
Q 4. Explain Virtualization: of CPU, Memory, I/O Devices, Network?	BLT-2	CO-3
Q 5. Virtualization of Server, Desktop and Virtualization of data-center?	BLT-4	CO-3

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III Year VI Semester

6CS4-06: Cloud Computing

ASSIGNMENT-IV

Q 1. Explain Policy Implementation, Cloud Computing Security Challenges?	BLT-2	CO-4
Q 2. Define Cloud Computing Security Architecture?	BLT-1	CO-4
Q 3. Data Security in Cloud: Business Continuity and Disaster Recovery?	BLT-4	CO-4
Q 4.Define Understanding and Identification of Threats in Cloud?	BLT-1	CO-4
Q 5.Define SLA-Service Level Agreements, Trust Management?	BLT-1	CO-4

ASSIGNMENT-V

Q 1. Explain Amazon web services, Google App Engine, Microsoft Azure Design?	BLT-2	CO-5
Q 2. Define Satellite Image Processing?	BLT-1	CO-5
Q 3. Define Social Networking, Cloud Application- Scientific Application?	BLT-1	CO-5
Q4. Explain Aneka: Cloud Application Platform?	BLT-2	CO-5
Q 5. Define Integration of Private and Public Clouds?	BLT-1	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

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III Year VI Semester

6CS3-01: Digital Image Processing

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q1.Define the image and digital image processing. Explain the fundamental steps of digital image processing with suitable diagram.	BLT-2	CO-1
Q2.What are the applications of digital image processing? Explain components of image processing system.	BLT-2	CO-1
Q3. Explain image sensing and acquisition.	BLT-2	CO-1
Q4.Compare image sampling and quantization process in image processing.	BLT-3	CO-1
Q5. Sketch and Explain digital image representation.	BLT-4	CO-1

ASSIGNMENT-II

Q1. What do you understand by histogram? Explain its various specification also explain histogram equalization.	BLT-2	CO-2
Q2. Explain various basic intensity transfer function.	BLT-2	CO-2
Q3. Describe spatial filtering.	BLT-3	CO-2
Q4. What is Fourier transform? Explain its properties.	BLT-2	CO-2
Q5. Explain image smoothing and sharpening using Frequency Domain Filters.	BLT-2	CO-2

ASSIGNMENT-III

Q1. Explain the different types of noise models?	BLT-2	CO-3
Q2. Define the estimation of degradation function?	BLT-1	CO-3
Q3. Explain the noise filter.	BLT-2	CO-3
Q4. What are the advantages of a wiener filter over an inverse filter?	BLT-3	CO-3

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III Year VI Semester

6CS3-01: Digital Image Processing

ASSIGNMENT-IV

Q1. Draw the block diagram of JPEG encoder & decoder.	BLT-3	CO-4
Q2. What is redundancy? Explain the different types of redundancies.	BLT-2	CO-4
Q3. Explain the lossy compression technique.	BLT-2	CO-4
Q4. What is Huffman's Coding? Explain in brief.	BLT-3	CO-4

ASSIGNMENT-V

Q1. Explain the first order derivative method for detection of an edge.	BLT-2	CO-5
Q2. What is region growing? Implement the process of splitting and merging an edge.	BLT-4	CO-5
Q3. Explain the Hough Transform.	BLT-2	CO-5
Q4. Explain the thre-sholding in brief. Also describe the type of thre-sholding.	BLT-2	CO-5
Q5. What is kernel? Explain the different type of kernels used in detection of edge.	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Computer Science and Engineering

III Year VI Semester

6CS4-03: Information Security System

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q. 1 What is the need of security?	BLT-1	CO-1
Q. 2 Classify Encryption And Decryption?	BLT-2	CO-1
Q. 3 Illustrate the following cryptographic technique; a. Substitution Technique b. Transposition Technique	BLT-4	CO-1
Q.4 Explain the key principles of Security with suitable example?	BLT-3	CO-1
Q.5 What is cryptography? Analyze Block and Stream Cipher in detail?	BLT-4	CO-1

ASSIGNMENT-II

Q. 1 What is the purpose of S-Box in DES?	BLT-2	CO-2
Q. 2 Describe DES (Data Encryption Standard) in detail?	BLT-1	CO-2
Q. 3 Compare the following: a. Cipher Feedback Mode(CFM) b. Output Feedback Mode(OFB)	BLT-3	CO-2
Q. 4 Explain in brief AES (Advance Encryption Standard)?	BLT-1	CO-2
Q. 5 Analysis the Strength In DES ?	BLT-4	CO-2

ASSIGNMENT-III

Q.1. Show how Diffie Hellman key exchange algorithms result in the same key? Also discuss the 'Man in middle attack' problem associated with the algorithm?	BLT-4	CO-3
Q. 2 Explain Elgamal Encryption and Decryption cryptosystem in detail?	BLT-2	CO-3
Q. 3 Analyze the role of RSA algorithm in public key cryptography? Explain the RSA algorithm with example?	BLT-4	CO-3
Q. 4 Explain the concept of Public key cryptography or symmetric key cryptography with example?	BLT-1	CO-3
Q. 5 Perform encryption and decryption using RSA Algorithm p=3,q=5,e(publick key),M(plain text)=4.	BLT-5	CO-3

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III Year VI Semester

6CS4-03: Information Security System

ASSIGNMENT-IV

Q. 1 What is digital signature? Show how signing and verification is done using DSS (digital signature standard)?	BLT-2	CO-4
Q. 2 Why we need method authentication justify your answer. Explain the concept of MAC and its function and what is hash function? Explain it?	BLT-2	CO-4
Q. 3 Explain Elgamal Digital Signature Scheme verification Scheme in detail?	BLT-3	CO-4
Q. 4 Explain Birthday attack on digital signature?	BLT-3	CO-4
Q. 5 Explain Schnorr Digital Signature and verification Scheme in detail?	BLT-3	CO-4

ASSIGNMENT-V

Q. 1 What is X.509 certificate? Differentiate between X.509 client certificate and a normal SSL certificate.	BLT-4	CO-5
Q. 2 Explain the concept of public key cryptography or asymmetric key cryptography with example? Differentiate between them.	BLT-4	CO-5
Q. 3 Explain important aspects that establish trust in digital signature.	BLT-2	CO-5
Q. 4 What is digital Signature? Show how signing and Verification is done using DSS.	BLT-4	CO-5
Q. 5 What are the difference between source authentication and source Non- repudiation? Also explain the MD5 in detail.	BLT-3	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Computer Science and Engineering

III Year VI Semester

6CS4-02: Machine Learning

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q1. Define machine learning and explain the difference between supervised, unsupervised, and reinforcement learning. Provide examples of applications for each type of learning.	BLT-2	CO-1
Q2. Explain the concept of linear regression. Describe how the least squares method is used to fit a linear model to a set of data points.	BLT-3	CO-1
Q3. Describe the Naive Bayes classifier.	BLT-2	CO-1
Q4. Explain the assumption of conditional independence and how it simplifies the computation of probabilities.		

ASSIGNMENT-II

Q1. Describe the K-means clustering algorithm. Explain the steps involved in the algorithm and how the centroids are updated during the process.	BLT-2	CO-2
Q2. Explain the difference between agglomerative and divisive hierarchical clustering. Describe the steps involved in agglomerative hierarchical clustering.	BLT-5	CO-2
Q3. Describe the Apriori algorithm for association rule mining.	BLT-1	CO-2
Q4. Explain the concepts of frequent item sets and the Apriori property.	BLT-2	CO-2

ASSIGNMENT-III

Q1. Describe the following feature selection methods and provide examples of each: a. Filter methods b. Wrapper methods	BLT-2	CO-3
Q2. Explain the concept of Principal Component Analysis (PCA). Describe the steps involved in performing PCA on a dataset and how it helps in feature extraction.	BLT-2	CO-3
Q3. Describe the Singular Value Decomposition (SVD) technique. Explain how SVD can be used for feature extraction and data compression.	BLT-2	CO-3
Q4. Describe the feature selection methods and provide examples of Embedded methods	BLT-2	CO-3

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III Year VI Semester

6CS4-05: Machine Learning

ASSIGNMENT-IV

Q1. Explain the components of a Markov Decision Process (MDP). How do states, actions, rewards, and transition probabilities define an MDP?	BLT-4	CO-4
Q2. Describe the Bellman equations in the context of reinforcement learning. How do they relate to the concepts of policy and value functions?	BLT-1	CO-4
Q3. Describe the Monte Carlo method for policy evaluation in reinforcement learning.	BLT-2	CO-4
Q4. How does it differ from other methods like temporal-difference learning?	BLT-2	CO-4

ASSIGNMENT-V

Q1. Define recommendation systems and explain their importance in modern applications. Provide examples of different types of recommendation systems used in practice.	BLT-1	CO-5
Q.2 Describe the difference between user-based collaborative filtering and item-based collaborative filtering?	BLT-2	CO-5
Q.3 Describe the content-based filtering approach for recommendation systems. How does it differ from collaborative filtering?	BLT-2	CO-5
Q.4 Explain the concept of collaborative filtering.	BLT-2	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.

Department of Computer Science & Engineering

III Year VI Semester

6CS5-11: Distributed System

Note: Each assignment of Maximum Marks 10.All question carries equal marks.

ASSIGNMENT-I

Q1. What is Distributed System? Explain with its features.	BLT-2	CO-1
Q2. What are the Distributed Computing Paradigms? Explain.	BLT-2	CO-1
Q3. What are the types of Operating System? Explain.	BLT-2	CO-1
Q4. Compare the design issues in Distributed System.	BLT-3	CO-1
Q5. Explain models of distributed system.	BLT-2	CO-1

ASSIGNMENT-II

Q1. What are Processes and Threads?	BLT-1	CO-2
Q2. What are the graph models for process representation?	BLT-2	CO-2
Q3. What are the characteristics of concurrent programming?	BLT-2	CO-2
Q4. What is Inter-process communication and Coordination? Explain.	BLT-2	CO-2
Q5. Explain RPC and RMI Case Studies.	BLT-3	CO-2

ASSIGNMENT-III

Q1. What is Distributed File System?	BLT-1	CO-3
Q2. What is Dynamic Load Sharing and Balancing?	BLT-1	CO-3
Q3. Explain Distributed Process Implementation.	BLT-2	CO-3
Q4. Explain Case Studies of the following: (i) Andrew and Coda File Systems (ii) Sun Network File Systems	BLT-2	CO-3
Q5. What is Static Process Scheduling?	BLT-1	CO-3

ASSIGNMENT-IV

Q1. Explain Non-Uniform Memory Access Architectures.	BLT-2	CO-4
Q2. What is Distributed Shared Memory? Explain.	BLT-2	CO-4
Q3. Explain Implementation of DSM Systems.	BLT-2	CO-4
Q4. Compare the following: (i) Distributed Mutual Exclusion (ii) Distributed Deadlock Handling	BLT-3	CO-4
Q5. What are the Models of Distributed Computation?	BLT-1	CO-4

ASSIGNMENT-V

Q1. Explain the concept of failure and recovery.	BLT-2	CO-5
Q2. Explain Byzantine Fault and Byzantine Agreement.	BLT-2	CO-5
Q3. Explain Randomized Distributed Agreement.	BLT-2	CO-5
Q4. Explain the concept of Replicated Data Management.	BLT-2	CO-5
Q5. Examine the CORBA Case Study.	BLT-4	CO-5

*BLT: BLT shows the **Bloom's taxonomy** levels.