Chhattisgarh Swami Vivekanand Technical University

University Teaching Department

Class Test-1 (*July-December 2024*)

B.Tech(H)-7th Semester

Branch: Data Science

Subject Name: Big Data Analytics

Max Marks: 40 **Min Marks:14** **Times: 2 hrs**

Note: All questions are compulsory

CO1. Develop a comprehensive understanding of big data technologies, tools, and techniques for processing and analysing large-scale datasets.
CO2. Acquire knowledge and skills in utilizing advanced analytics methods tailored for big data to extract meaningful insights.
C04. Gain proficiency in utilizing big data platforms and tools such as Hadoop, Spark, and NoSQL databases for efficient data processing and analysis.

Q.No.		Questions	Marks	BL	CO
		UNIT 1			
1	a	What is a SPOF in HDFS?	2	L1	1
	b	Represent HDFS architecture and explain the working?	6	L2	1
	c	Explain the ethical and legal considerations for big data analytics?	6	L2	1
		UNIT 2			
2	a	Define missing data and explain how it can affect big data analysis	2	L2	2
	b	Differentiate Apache Pig and Hive. Describe the advantages of using Apache Pig and Apache Hive for scalable data preprocessing in big data environments.	6	L3	4
	c	What are the techniques to identify and handle outliers in big data? Provide examples of when removing outliers may lead to loss of important information.	6	L4	2
		UNIT 3			
3	a	Explain Map reduce.	6	L3	4
	b	Write the difference between Hadoop and Spark.	6	L4	4

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Subject Name: Image Processing **Subject Code:**
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: All questions are compulsory

CO 1: Understand the theoretical foundation of Digital image processing.
CO 2: Apply various image enhancement techniques to improve image quality and visual appearance.

Q.No.		Questions	Marks	BL	CO
		UNIT 1			
1	a	Write Various Applications of Digital image Processing.	4	L1	1
	b	Discuss the Various image processing Steps.	8	L2	1
	c	Explain the Image Acquisition and preprocessing techniques.	8	L3	1
		UNIT 2			
2	a	what is contrast stretching.	4	L1	
	b	Explain the different types of gray level transformation.	8	L2	
	c	Generate an equalized histogram of 4 bit gray scale image Associated with a table of the numbers nk of the numbers.	8	L2	

k	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
n_k	15	0	0	0	0	0	0	0	70	110	45	80	40	0	0

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Subject Name: Gaming Theory **Subject Code: D127774(022)**
Max Marks: 40 **Min Marks:14** **Time: 2 hrs**
Note: All questions are compulsory

CO 1: To understand the fundamental principles and concepts of game theory and its application in AI and data science.
CO 2: To explore strategic interactions among rational decision-makers using game-theoretic approaches.
CO 3: To analyze and solve games using various solution concepts like Nash equilibrium and dominant strategies

Q.No.		Questions	Marks	BL	CO
		UNIT 3			
1	a	Which one of the following games does not have a pure strategy Nash equilibrium? (a) Prisoner's Dilemma (b) Battle of Sexes (c) Matching Pennies (d) Tragedy of Commons	2	L1	3
	b	Explain why Rock-Paper-Scissors is considered a strictly competitive game.	6	L2	3
	c	In a matrix game where the payoff matrix A is anti-symmetric, explain why the value of the game for the row player in mixed strategies is zero.	6	L3	3
		UNIT 2			
2	a	Which of the following games always have a PSNE? (a) Finite zero-sum game. (b) Finite asymmetric game. (c) Finite symmetric game. (d) Finite congestion game.	2	L2	2
	b	What is Yao's lemma? Explain in depth.	6	L2	2
	c	What is a ε-PSNE? How can it be computed efficiently?	6	L3	2
		UNIT 1			
3	a	Write pseudocode for an AI assistant (like Jarvis) that, when the user says **"Jarvis, suit up,"** initiates a startup sequence displaying system status and readiness. Generate and display the game's payoff matrix and suggest an optimal strategy (pure or mixed) based on game theory concepts.(You can make Assumptions as per your need)	6	L6	1
	b	Explain Types of games: Cooperative and Non-Cooperative, Zero-Sum, and Non-Zero-Sum, Pure and Mixed strategies.	6	L4	1

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Subject Name: Data Wrangling **Subject Code:**

Max Marks: 40 **Min Marks:14** **Times: 2 hrs**

Note: All questions are compulsory

CO 1 Equip students with essential skills and techniques for acquiring, cleaning, transforming, and preparing raw data for analysis.

CO2: Provide students with knowledge and tools to handle diverse data formats efficiently.

CO4: Teach students how to create structured datasets suitable for analysis and modelling in data science projects.

Q.No.		Questions	Marks	BL	CO
		UNIT 1			
1	a	What is data wrangling, and why is it important in data analysis ?	4	L1	1
	b	Explain how EDA can be used to identify missing values and inconsistencies in a dataset.	8	L2	2
	c	How do missing data, outliers, and duplicates affect the results of a machine learning model?	8	L4	4
		UNIT 2			
2	a	What is one-hot encoding? Provide an example.	4	L1	1
	b	Define the stack and unstack operations in pandas. Provide an example of each.	8	L2	2
	c	Analyze how aggregation can simplify complex datasets for clearer insights.	8	L4	4

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Subject Name: Software Engineering **Subject Code: D128773(022)**
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: Question (a) is compulsory, attempt any two questions from (b), (c), and (d).

CO 1: *The learner acquires basic concepts regarding Software engineering principles, SDLC & Requirements engineering.*
CO 2: *The learner understands the principles of Software design & AI systems, Architectural styles.*

Q.No.		Questions	Marks	BL	CO
		UNIT 1			
1	a	Define Requirement engineering. What are the techniques used in Requirement engineering?	4	L1	1
	b	Explain the principles and practices of Agile model.	8	L2	1
	c	What are the Ethics and Professional practices in Software engineering? Explain the key roles in Scrum framework for Software development.	8	L2	1
	d	Explain each phase of Software Development Life Cycle (SDLC).	8	L2	1
		UNIT 2			
2	a	What are the characteristics of Client component and Server component in Client-Server architecture?	4	L1	2
	b	Explain the following: a) Modifiability c) Adaptability b) Cohesion d) Content coupling	8	L2	2
	c	What are the different attributes used in ER-diagram? Give one example of unary and 4-ary relationship in ER-diagram. Explain Class diagram with example.	8	L3	2
	d	Explain UML modeling technique? Draw DFD diagram having Level 0 DFD, Level 1 DFD and Level 2 DFD.	8	L3	2

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Subject Name: Management Information System **Subject Code:**

Max Marks: 40 **Min Marks:14** **Times: 2 hrs**

Note: All questions are compulsory

CO1: Relate the basic concepts and technologies used in the field of management information systems
CO2: Compare the processes of developing and implementing information systems
CO4: Translate the role of information systems in organizations, the strategic management processes, with the implications for the management
CO5: Apply understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization

Q.No.		Questions	Marks	BL	CO
		UNIT 1			
1	a	**Explain the CCR Framework in Management Information Systems.**	4	2	1
	b	**Compare and contrast the roles of SCM and SRM systems in supply chain optimization.**	8	4	2
	c	**Analyze the role of MIS in organizational decision-making processes.**	8	4	1
	d	**Analyze the relationship between data warehousing and business intelligence in a retail business.**	8	4	5
		UNIT 2			
2	a	**Describe the role of Human Resources Information Systems (HRIS) in managing employee data.**	4	2	1
	b	**Demonstrate how cloud strategies can be incorporated into a company's existing IT infrastructure.**	8	3	4
	c	**Apply the concept of Finance and Accounting Systems to create a budget forecast for a startup company.**	8	3	4
	d	**Critically evaluate the use of Manufacturing Systems in reducing production time and maintaining quality.**	8	4	5