Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2 (*July-December 2024*)
B. Tech(H)-7th Semester
Branch: Artificial Intelligence

Subject Name: Business Intelligence and Analytics
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: All questions are compulsory

CO4. Familiarize with advanced concepts and techniques essential for effective utilization of intelligent systems in practical scenarios.
CO5. Acquire practical skills and theoretical knowledge necessary to address challenges and opportunities in the field of intelligent systems and robotics.

Q.No.		Questions	Marks	BL	CO
		UNIT 4			
1	a	Briefly explain the concept of time series forecasting. What makes it suitable for demand prediction?	4	L4	4
	b	Discuss the use of clustering techniques in customer segmentation and profiling. Explain how clustering algorithms like K-means and hierarchical clustering can help businesses tailor marketing strategies for different customer segments.	8	L4	4
	c	Consider a medical store data for suggesting a particular medicine combination for seasonal ailments. Select a appropriate model for the prediction.	8	L5	4
		UNIT 5			
2	a	What is prescriptive analytics, and how does it differ from descriptive and predictive analytics in business intelligence?	4	L5	5
	b	"Examine three emerging trends in business intelligence: artificial intelligence (AI), machine learning (ML), and augmented analytics. Discuss how each trend enhances data-driven decision-making processes and enables businesses to uncover deeper insights from data.	8	L5	5
	c	Explain RDD. And compare apache Spark with Hadoop	8	L5	5

Resilient Descriptive Dataset.

Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2 (*July-December 2024*)
B. Tech (H)-7th Semester
Branch: Artificial Intelligence

Subject Name: Intelligent System and Robotics **Subject Code: D127771(022)**

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

Note: Questions are (a) compulsory and Attempt any two (b) ,(c), and (d)

CO 3: Develop proficiency in designing, developing and deploying intelligent robotic system for real world tasks.
CO 4 : Familiarize with advanced concepts and techniques essential for effective utilization of intelligent system in practical scenarios.
CO 5 : Acquire practical skills and Theoretical knowledge necessary to address challenges and opportunities in the field of intelligent system and robotics.

Q.No.		Questions	Marks	BL	CO
		PART A			
1	a	What is Control Architecture of Autonomous Robot.	4	L1	3
	b	Discuss Human Robot interaction and collaborative Robots.	8	L2	3
	c	Demonstrate path planning and motion Control Techniques for Robot Navigation.	8	L3	3,5
	d	Explain Autonomous Exploration and Mapping in unknown environment.	8	L2	3,5
		PART B			
2	a	What do you mean by Robot interaction.	4	L1	4
	b	Explain the Techniques of Robot manipulation and Assistive Robotics.	8	L2	4
	c	Illustrate the Applications in Healthcare.	8	L4	4
	d	Write short Notes on : 1) Imitation learning 2) Transfer learning	8	L3	4,5

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – 2 Session- July – Dec, 2024 Month-November

Sem- BTech(H) 7th (AI) Subject- Software Engineering Code- D127773(022)

Time Allowed: 2 hrs Max Marks: 40 Min Marks: 14

Note: - Q1 is compulsory, attempt any two questions from Q2, Q3, and Q4.

CO3: The learner understands the coding standards and software testing techniques.
C04: The learner understands the software maintenance activities and software refactoring techniques.
C05: The learner understands the project management framework and effort estimation models.

Q.N.	Questions	Marks	Levels of Bloom's Taxonomy	CO
	Unit III			
Q1	What do you understand by programming paradigm? Explain two programming paradigms.	[4]	L1	3
Q2	What are the key elements of BDD? Explain code comments and documentation coding standard. Give two documentation tools.	[8]	L2	3
Q3	Explain various incremental integration. Give an example of docstrings.	[8]	L2	3
Q4	What are the characteristics of the software testing template? Explain best practices for software development.	[8]	L2	3
	Unit IV & V			
Q1	What are the major capabilities that version control system implements?	[4]	L1	4
Q2	Explain how Work Breakdown Structure (WBS) is structured in software engineering.	[8]	L2	5
Q3	Explain various strategies for modernizing and migrating legacy systems. Perform code refactoring to implement encapsulate field.	[8]	L3	4
Q4	(a) Explain agile effort estimation technique. (b) Suppose we have the following counts for different elements, with their respective weights: **Element Type** **Count** **Weight** External Inputs 20 4 External Outputs 10 5 Internal Logic 15 7 Assume Complexity Adjustment Factor (CAF) = 1.2 and Productivity Rate = 10. Calculate the Adjusted Function Points (AFP) and Effort.	[8]	L3	5

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – II Session- July – Dec, 2024 Month- November

Sem- CSE 7th (Artificial Intelligence)

Subject- Image Processing (Professional Elective II) Code- D127771(22)

Time Allowed: 2 Hours Max Marks: 40

Digonal element

Note: - All the question are compulsory.

	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Part A			
Q1 (a)	Which of the following statements is true about thresholding in image segmentation? a) Thresholding is a method to extract edges in an image. b) Thresholding divides an image into regions based on intensity values. c) Thresholding uses frequency domain analysis for segmentation. d) Thresholding is a feature extraction technique.	[2]	Understand	CO3
(b)	Which edge detection algorithm uses a Gaussian filter to reduce noise before detecting edges? a) Sobel b) Prewitt c) Canny d) Laplacian	[2]	Understand	CO1
(c)	Which of the following is NOT a feature extraction technique? a) Corner detection b) Texture analysis c) Fourier transform d) Edge detection	[2]	Understand	
(d)	An image histogram shows pixel intensities ranging from 0 to 255. If a threshold value of 128 is applied, how will the image be divided? a) Pixels with values >128 as black, ≤128 as white. b) Pixels with values ≤128 as black, >128 as white. c) Pixels with values >128 as edges, ≤128 as smooth. d) Pixels with values >128 as regions, ≤128 as edges.	[2]	Apply	
Q2	Write a step-by-step algorithm for the region-based segmentation technique and explain its application in medical imaging?	[4]	Apply	CO3
Q3	Consider a 5×5 grayscale image represented by the matrix below. Perform adaptive thresholding using a 3×3 local window and a mean-based thresholding method. Assume the threshold T for each pixel is calculated as T = mean of the 3×3 window C T=mean of the 3×3 window−C, where C= 5. Threshold the image such that pixel values greater than or equal to T are set to 255 (white) and others to 0 (black).	[4]	Apply	CO3

	$\begin{bmatrix} 100 & 102 & 104 & 101 & 103 \\ 98 & 100 & 102 & 103 & 104 \\ 97 & 99 & 101 & 102 & 103 \\ 96 & 98 & 100 & 101 & 102 \\ 95 & 97 & 99 & 100 & 101 \end{bmatrix}$			
Q4	Discuss the importance of edge detection in image processing. Compare the Sobel and Canny edge detection algorithms.	[4]	Understand	CO3
	Part B			
Q1 (a)	What is the primary purpose of the erosion operation in morphological image processing? a) Remove noise from images b) Shrink objects in an image c) Connect broken parts of objects d) Detect edges of objects	[2]	Understand	CO4
(b)	Which of the following operations is used to fill small holes in an image? a) Erosion b) Dilation c) Closing d) Opening	[2]	Understand	CO4
(c)	In JPEG compression, which transform is primarily used to convert spatial data into frequency data? a) Discrete Wavelet Transform (DWT) b) Discrete Cosine Transform (DCT) c) Fourier Transform d) Haar Transform		Understand	CO5
(d)	Wavelet compression differs from JPEG compression primarily because it: a) Uses the frequency domain b) Operates on fixed block sizes c) Can achieve multi-resolution representation d) Utilizes binary arithmetic encoding		Understand	CO5
Q2	Compare and contrast opening and closing operations in morphological image processing. Provide examples where each operation is preferred.	[4]	Understand	CO4
Q 3	Consider a binary image where the structuring element is a 3×3 square. Perform erosion on the following binary image- Image: $\begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$	[4]	Apply	CO4
Q4	Describe the process of JPEG compression. Explain the role of Discrete Cosine Transform (DCT) and quantization in reducing file size?	[4]	Apply	CO5

iChhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2 (*July-December 2024*)
B.Tech(H)-7th Semester
Branch: Artificial Intelligence/Data Science

Subject Name: Management Information System
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: All questions are compulsory

CO1: Develop understanding of foundational concepts in IT strategy and emerging technologies.
CO2: Demonstrate quantitative evaluation of IT strategies.
CO3: Synthesize knowledge of advanced MIS tools.
CO4: Quantitatively evaluate management information systems.

Q. No.		Questions	Marks	BL	CO
		UNIT 1			
1	a.1	Which of the following is a key benefit of aligning IT strategy with business strategy? a) Reduces hardware costs b) Increases employee retention c) Improves organizational performance d) Simplifies software development	1	2	1
	a.2	In B2B e-commerce, the primary participants are: a) Consumers and businesses b) Businesses and other businesses c) Consumers only d) Businesses and governments	1	2	1
	a.3	Which technology allows devices to communicate and exchange data over the internet without human intervention? a) Blockchain b) Cloud Computing c) Internet of Things (IoT) d) Virtual Reality	1	2	1
	a.4	Which emerging technology is most closely associated with distributed ledgers? a) Big Data b) Blockchain c) Artificial Intelligence d) Augmented Reality	1	2	1
	b	Explain the concept of IT-business alignment and its significance in modern organizations.	8	3	1
	c	Describe the role of cloud and vendor strategies in the formulation of an IT strategy.	8	3	1
	d	A company uses a balanced scorecard for IT-business alignment. If the weights assigned to the four perspectives (Financial, Customer, Internal Processes, Learning and Growth) are 30%, 25%, 25%, and 20%, respectively, and their respective performance scores are 80, 70, 90, and 85, calculate the overall balanced scorecard performance score.	8	5	2

Q. No.		Questions	Marks	BL	CO
		UNIT 2			
2	a.1	What is the primary purpose of Augmented Reality (AR) technology? a) To replace the real world with a virtual one b) To overlay digital information on the real world c) To analyze large datasets in real-time d) To automate repetitive business tasks	1	2	3
	a.2	Which emerging technology allows employees to use their personal devices securely in a workplace environment? a) Bring Your Own Device (BYoD) b) Internet of Things (IoT) c) Virtual Reality (VR) d) Cloud Computing	1	2	3
	a.3	Which system is designed to simulate human expertise in a specific domain? a) Learning Management System b) Decision Support System c) Expert System d) Executive Information System	1	2	3
	a.4	Which ethical issue is most relevant when organizations analyze personal user data? a) Data accuracy b) Privacy violation c) System reliability d) Cost efficiency	1	2	3
	b	Describe the differences between Expert Systems and Executive Information Systems with examples.	8	3	3
	c	Explain how Learning Management Systems contribute to knowledge management in organizations.	8	3	3
	d	An executive information system tracks performance metrics for a company. If the system measures three metrics: Revenue Growth (20%), Customer Satisfaction (40%), and Employee Productivity (40%), and the scores for these metrics are 85, 75, and 90, respectively, calculate the weighted average performance score.	8	5	4

Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Class Test-2 (*Nov 2024*)
B. Tech(H)-7th Semester
Branch: Artificial Intelligence / Data Science

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

CO 3: To analyze and solve games using various solution concepts like Nash equilibrium and dominant strategies.
CO 4: To model real-world AI problems using game-theoretic approaches in multi-agent systems.
CO 5: To design and implement game-theoretic algorithms for AI applications like auctions and reinforcement learning.

Q.No.		Questions	Marks	BL	CO
		UNIT 4			
1	a	Which of the following domains ensures the critical value function is well-defined? (a) Single-parameter domain (b) Quasi-linear domain (c) Convex domain (d) Any domain	2	L1	3
	b	Explain Myerson's Lemma and its role in characterizing allocation rules in a single-parameter domain.	6	L2	3
	c	Describe the DSIC mechanism's allocation rule in the single-parameter domain and its necessary conditions.	6	L3	3
		UNIT 5			
2	a	What is the kind of domain of the type set of each player in the mechanism design problem of Knapsack allocation? (a) Arbitrary (b) Quasi-linear but not convex (c) Convex but not single-parameter (d) Single-parameter	2	L1	4
	b	Explain the deferred acceptance algorithm and its properties in achieving stable matching.	6	L2	4
	c	Write pseudocode for implementing a men-proposing deferred acceptance algorithm and analyze its complexity.	6	L3	4
		UNIT 5			
3	a	Discuss the importance of monotonicity in allocation rules under mechanism design and give an example.	6	L2	5
	b	Design a strategic bidding game and compute the Nash equilibrium for a given payoff matrix.	6	L6	5