SRINIX COLLEGE OF ENGINEERING, BALASORE

DEPARTMENT OF
COMPUTER SCIENCE & ENGINEERING

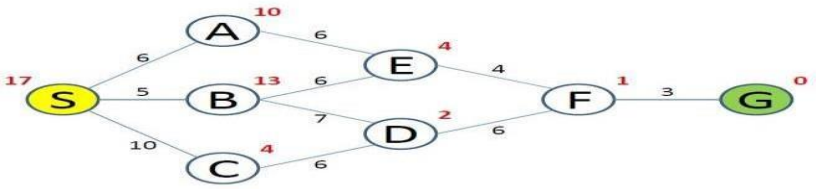
ASSIGNMENT ON
ARTIFICIAL INTELLIGENCY AND MACHINE LEARNING

ARTIFICIAL INTELLIGENCY AND MACHINE LEARNING

ASSIGNMENT-I

1.	**a**	Illustrate various characteristics of Intelligent agents.
	b	Explain Foundations of Artificial Intelligence.
2.	**a**	Illustrate any four PEAS description of the task environment for intelligent agents and explain it.
	b	What are the applications of Artificial Intelligence?
3.	Sketch the following agent types and illustrate its working principle with merits, demerits. i) Simple reflex agent. ii) Model based agent. iii) Utility based agent iv) Goal based agent	
4.	**a**	Tabulate comparison of Human Intelligence with Artificial Intelligence.
	b	Discuss about agents and various Properties of environment.
5.	**a**	Explain in detail about structure of Intelligent agents.
	b	Adapt the suitable strategy to solve a N-Queen Problem.
6.	**a**	Analyse water jug problem in AI with operators involved in it.
	b	Design and Solve Vacuum Cleaner toy problem in AI.
7.	**a**	Describe typical Intelligent system briefly.
	b	Give your opinion how Artificial intelligence helps in achieving Data Security. Justify your opinion.
8.	**a**	Illustrate the different Artificial Intelligence problems.
	b	Predict and analyse future application areas of Artificial Intelligence.
9.	**a**	Demonstrate the various Components of problem definition in AI.
	b	Discuss learning Agent in AI.
10.	Summarize various Typical Intelligent Agents in Artificial Intelligence?	

ASSIGNMENT-II

1	List various uninformed search techniques and explain any four techniques with appropriate step-by-step sketch.		
2	a	Identify and explain in detail about optimization problems?	
	b	Demonstrate the process of simulated annealing with example?	
3	a	Explain A* Algorithm finds a shortest distance between Source and Goal state?	
	b	 Simulate the A* Algorithm for the above problem, Here S denotes Starting State, G-Goal State.	
4	a	Analyze Depth Limited search and Bidirectional search techniques with suitable examples?	
	b	Describe the process of simulated annealing with example?	
5	a	Summarize various types of Hill climbing search techniques in AI.	
	b	Outline the concept of breadth-first search technique with suitable example and also specify the performance measure of BFS.	
6	a	Demonstrate AO* Algorithm in AI with suitable example.	
	b	What is Constraint Satisfaction Problem? Explain it with example.	
7	a	Describe fully and partial observation search algorithms?	
	b	Justify how optimal decisions in gaming helps to maximize chances?	
8	a	Describe the DFS algorithm with examples?	
	b	Identify different informed search techniques in AI?	
9	Illustrate the working principle of Alpha – Beta pruning with neat sketch.		
10	a	Interpret backtracking search in graph coloring problem?	
	b	Design a solution for the following Crypt arithmetic Problem of CSP in AI.	SEND +MORE MONEY

ASSIGNMENT-III

1	a	Explain the various types of Machine Learning techniques.
	b	List out an applications of Machine Learning.
2	a	Describe classification techniques in supervised learning with an example.
	b	List out various Regression techniques in Machine Learning.
3	a	Explain about Decision Trees in supervised learning.
	b	Compare Univariate and Multivariate Decision Trees.
4	a	Differentiate various Parametric and Non-Parametric Methods.
	b	Differentiate Supervised and Unsupervised Machine learning.
5	Summarize the following models. (i) Linear regression (ii) Logistic regression	
6	a	Analyze linear discrimination model in Machine Learning.
	b	Discriminate logistic discrimination analysis in machine learning.
7	a	Illustrate multi-layer perception learning.
	b	Analyze Regression discrimination in machine learning.
8	Discuss Back Propagation Algorithm with an example.	
9	Apply Bayesian Decision Theory in artificial intelligence.	
10	a	Elaborate the Bayes Estimator in supervised learning?
	b	Illustrate Gradient descent algorithm and its variants.

ASSIGNMENT-IV

1	a	Discuss the following terms i. unsupervised learning ii. Clustering
	b	Illustrate the mixtures of latent variable models?
2	a	Illustrate the Principle Component Analysis technique?
	b	How mixture density is calculated in unsupervised learning?
3	a	Demonstrate supervised learning after clustering.
	b	Illustrate about the spectral clustering in supervised learning.
4	a	Implement for the finite words classification system using back propagation algorithm.
	b	Explain the procedure for choose the number of clusters in USL?
5	a	Describe briefly about subset selection.
	b	Infer the similarities and differences between average-link clustering and k-means?
6	a	Generalize K-Means algorithm in Machine Learning.
	b	How can we make k-means robust to outliers?
7	a	Illustrate in detail about multidimensional scaling?
	b	Describe Singular Value Decomposition and Matrix Factorization.
8	a	Analyze the maximization algorithm with simple example?
	b	In factor analysis, how can we find the remaining ones if we already know some of the factors?
9	a	Demonstrate Hierarchical Clustering with simple example?
	b	List out the various unsupervised learning techniques?
10	Summarize the following terms briefly i. PCA ii. LDA	

ASSIGNMENT-V

1	a	Explain the following terms i. Reinforcement learning ii. Density Estimation
	b	Compare unsupervised learning and Reinforcement learning?
2	a	State and explain Non Parametric Density Estimation?
	b	Explain Histogram Estimator with simple example?
3	a	Analyze the K-Nearest Neighbor Estimator.
	b	Elaborate Non Parametric Classification?
4	a	Illustrate Condensed Nearest Neighbor in reinforcement learning?
5	a	Write in detail about Single State Case: K-Armed Bandit.
	b	What are the Elements are involving Reinforcement Learning using Markov Decision Process (MDP)
6	a	Discuss the following terms i. Non parametric estimation ii. Instance based learning
	b	Explain Model-Based Learning with an example?
7	a	Illustrate in detail about K-Armed Bandit in reinforcement learning?
	b	List and explain in detail about elements of reinforcement learning?
8	a	Describe Exploration Strategies and deterministic rewards in Temporal Difference Learning?
	b	State and explain non parametric density estimation?
9	a	Explain the Nonparametric rewards and actions in temporal difference learning?
	b	Assess in detail about partially observables states in learning?
10	a	Explain Generalization process in Temporal difference Learning?
	b	List and explain in detail about elements of reinforcement learning?