University of M'sila
Faculty of Mathematics & Computer Science (CS)
Department of Computer Science

Course: Diagnosis Methods for Master1 (AI)

Year: 2023-2024 **Duration: 1:30**

Final Exam

Q1. (3 points)

Based on your presentations, complete the following table:

Algorithm	System overview	Inputs	Outputs
ANN			
KNN			

Q2. (10 points)

Select ONE choice from the following:

1. It involves automatically discovering natural grouping in data:
   a. ANN
   b. K-means
   c. KNN
   d. None of the mentioned

2 It is the estimation of the size and type or nature of the fault:
   a. Fault detection
   b. Fault isolation
   c. Fault identification
   d. All of them

3. It is very suitable for high dimensionality, noisy, imprecise or imperfect data:
   a. ANN
   b. K-means
   c. KNN
   d. None

4. K-means algorithm belongs to:
   a. model based approaches
   b. Hierarchical clustering
   c. Partitioning clustering
   d. None

5. An artificial neuron:
   a. Computes the weighted sum of its inputs
   b. Adds its bias
   c. Passes the value through an activation function
   d. All

6. In SADT, things used and transformed by activities are called:
   a. Control
   b. Mechanism
   c. Outputs
   d. Inputs

7. Adjusting the weights of an artificial neuron is called:
   a. Neuron fire

b. Training

c. Testing

d. Overfitting

8. The diagnostic system should be able to distinguish between different failures. This is called:
   a. Separability
   b. Identification of new modes of malfunction
   c. Adaptability
   d. Ease of explanation
9. To assess the quality of each cluster, we calculate:
   a. The centroid of each cluster
   b. Within Cluster Square of Sum
   c. Within Cluster Sum of Square
   d. The elbow plot
10. It is the analysis of minimal cut sets to identify any failure:
   a. Qualitative analysis
   b. Quantitative analysis
   c. SADT
   d. The similarity analysis

Q3. (7 points)

Suppose we have the following dataset:

Height (in cms)	Weight (in kgs)	T Shirt Size	Euclidean distance
158	58	M	4.2
160	59	M	2.2
163	61	M	2
165	61	L	4
168	62	L	7.1
170	63	L	9.2

1. With k=3, we select the 3 nearest neighbors with 2, 2.2, and 4 distances. Two of them are M so the new customer has also M size.
2. Advantage: Simple to implement and use
3. Disadvantage: Curse of dimensionality