

Course No: SWE 5437  
Course Title: Artificial Intelligent.  
Date: 27/ 11/ 2014  
No. of Questions: \_\_\_\_\_3\_\_\_\_\_  
Time: 1 H.  
Using Calculator (Yes)

University of Palestine



Midterm Exam  
1<sup>st</sup> Term 2014/2015  
Total Grade: 40

Instructor Name: Eng. M. Timraz  
Student No.: \_\_\_\_\_  
Student Name: \_\_\_\_\_  
College Name: Engineering  
Dep. / Specialist: Software  
Using Dictionary (No)

**First Question**

**No. of Branches (2)**

**(10/60)**

**Q1 B1:**

**(5/10)**

For the following sample categorical data set draw the symbol and frequency table.

Records	Attributes
X1	(A, A, B, C, C, C, D, D, A, A)
X2	(B, A, A, C, A, C, D, D, B, D)
X3	(A, D, B, C, D, C, D, C, A, C)
X4	(B, A, C, D, C, A, D, D, A, B)
X5	(A, D, B, B, D, A, C, D, A, C)
X6	(B, A, B, C, C, C, D, D, B, A)

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**Q1 B2** **(5/10)**

From the following symbol and frequency table return the origin data set contains all objects?

$$\begin{pmatrix} A & B & D & A & B & C \\ B & A & C & C & C & B \\ & & A & D & D & D \end{pmatrix}$$

$$\begin{pmatrix} 3 & 0 & 0 & 3 & 1 & 1 \\ 0 & 3 & 0 & 0 & 1 & 1 \\ & & 3 & 0 & 1 & 1 \end{pmatrix}$$

**Second Question** **No. of Branches (3)** **(20/60)**

**Q2 B1** **(10/20)**

Find the Proximity Matrix and Covariance matrix for the following nominal data objects?

Object\Attributes	Code	Line	Strength	Stability	Colour
X1	A	1	Yes	Poor	White
X2	A	1	No	Poor	White
X3	B	1	No	Good	Black
X4	B	0	Yes	poor	Black
X5	B	0	NO	Good	White
X6	B	1	Yes	poor	Black

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**Q2 B2**

**(5/20)**

Find all well-separated clusters in the set of points shown in Figure



**Q2 B3**

**(5/20)**

Identify the clusters in Figure 8.36 using the center-, contiguity-, and density-based definitions. Also indicate the number of clusters for each case and give a brief indication of your reasoning. Note that darkness or the number of dots indicates density. If it helps, assume center-based means K-means, contiguity-based means single link, and density-based means DBSCAN.



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**Q3 B1**

**(10/60)**

Use the following similarity matrix to find the dissimilarity matrix, and then try to classify them to two clusters according to the threshold value (0.2) for the dissimilarity between the objects.

	p1	p2	p3	p4	p5
p1	1.00	0.10	0.41	0.55	0.35
p2	0.10	1.00	0.64	0.47	0.98
p3	0.41	0.64	1.00	0.44	0.85
p4	0.55	0.47	0.44	1.00	0.76
p5	0.35	0.98	0.85	0.76	1.00

**Good Luck**