Pattern Recognition and Application

Assignment- Week 1

TYPE OF QUESTION: MCQ

Number of questions: **10** **Total mark: 10 X 2 = 20**

QUESTION 1:

Which of the following statement/(s) is/are correct?

a) Chain code is translation variant.
b) Chain code is rotation invariant.
c) Differential chain code is rotation invariant.
d) All of these.

Correct Answer: c.

Detailed Solution:

Differential chain code is independent of rotation. Therefore, it is rotation invariant.

Hence option c is correct.

QUESTION 2:

Which of the following feature corresponds to boundary based features?

I. Intensity
II. Chain code
III. Polygonal approximation
IV. Signature

a) Only I
b) Only I and IV
c) II, III and IV
d) All of these

Correct Answer: c.

Detailed Solution:

Chain code, polygonal approximation and signature are function of boundary of an object.

Hence option c is correct.

QUESTION 3:

For representation of a circle, radius and center are used features, then which of the following is/are correct?

a) Radius is translation invariant.
b) Center is translation variant
c) Radius and center both are translation invariant
d) Both a and b

Correct Answer: d.

Detailed Solution:

For a circle, center changes with translation but radius in invariant to translation.

Hence option d is correct.

QUESTION 4:

Which of the following is/are true?

I. In case of supervised learning, known patterns or labelled data are used for training purpose.
II. In case of unsupervised learning, additional step of data agglomeration is done based on similarity.

a) Only I
b) Only II
c) Both I and II
d) Neither I and II

Correct Answer: c.

Detailed Solution:

In case of supervised learning, known patterns or labelled data are used for training purpose.

In case of unsupervised learning, additional step of data agglomeration is done based on similarity.

Hence option c is correct.

QUESTION 5:

When two classes can be separated by a straight line, they are known as-

a) Linearly separable classes
b) Linearly inseparable classes
c) May depend on system, can be separable/inseparable
d) All of the above

Correct Answer: a.

Detailed Solution:

When two classes can be separated by a straight line, they are known as linearly separable classes

Hence option a is correct.

QUESTION 6:

Given patterns: $P_1 = \langle 3,4,5,10 \rangle$, $P_2 = \langle 3,4,6,10 \rangle$, $P_3 = \langle 104,105,106,10 \rangle$. Which of the following statements is correct?

a) P_1 and P_2 are similar
b) P_1 and P_3 are similar
c) P_1 and P_2 are dis-similar
d) All of the above.

Correct Answer: a.

Detailed Solution:

Euclidean distance between P_1 and P_2 is 1.

Euclidean distance between P_1 and P_3 is $100\sqrt{3}$.

Euclidean distance between P_2 and P_3 is $100\sqrt{2}$.

Hence option a is correct.

QUESTION 7:

Compute the chain code of the given structure in Figure 1 using the coded direction given in Figure 2. Assume 8-connectivity and moving in clockwise direction.

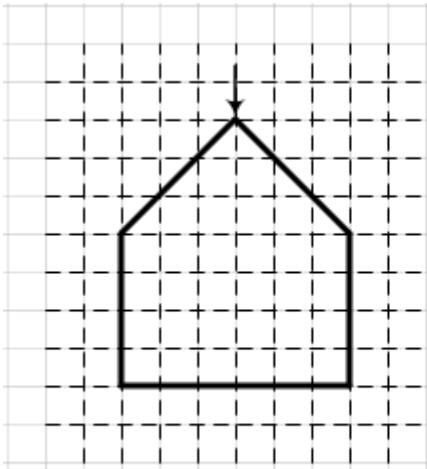


Figure 1

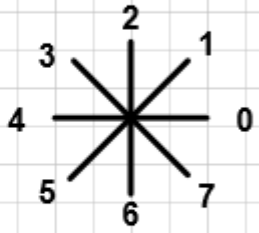


Figure 2

a) 77766644444442222111
b) 77776664444442222111
c) 77766664444442222111
d) 77766664444422222111

Correct Answer: c.

Detailed Solution:

Using the directional code of Figure 2, chain code for Figure 1 is 77766664444442222111.

Hence option c is correct.

QUESTION 8:

Compute the differential code of the given structure in Figure 1 using the coded direction given in Figure 2. Assume 8-connectivity and moving in clockwise direction. For counting differential direction use anticlockwise direction.

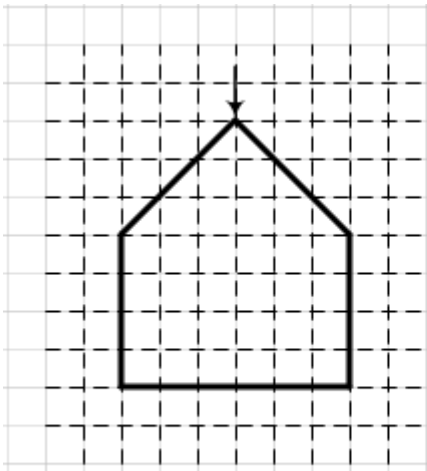


Figure 1

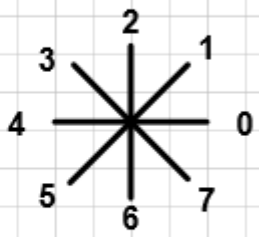


Figure 2

a) 60070006000006000700
b) 60007000600000600070
c) 60070006000006007000
d) 60070006000000600070

Correct Answer: a.

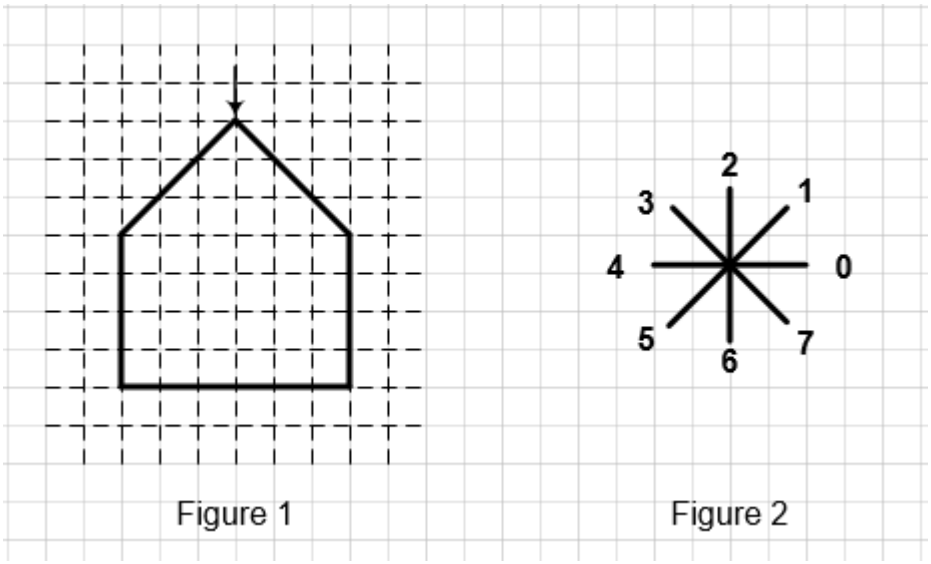
Detailed Solution

Using the directional code of Figure 2, differential chain code for Figure 1 is 60070006000006000700.

Hence option a is correct.

QUESTION 9:

Compute the shape number (largest number) using differential chain code of the given structure in Figure 1 using the coded direction given in Figure 2. Assume 8-connectivity and moving in clockwise direction. For counting differential direction use anticlockwise direction.



a) 70006000006000700600
b) 70060070000600000600
c) 70060070006000000000
d) 70060070006000006000

Correct Answer: d.

Detailed Solution:

The shape number (largest number) using differential chain code of the given structure 70060070006000006000.

Hence option d is correct.

QUESTION 10:

Which of the following geometrical shape corresponds to the signature given in Figure 3?

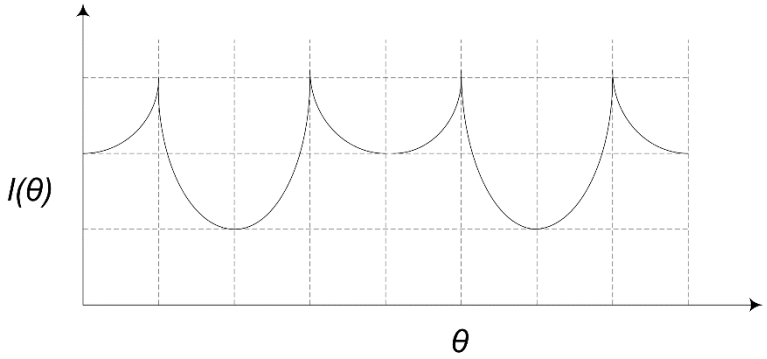


Figure 3

a) Circle
b) Square
c) Rectangle
d) Equilateral triangle

Correct Answer: c.

Detailed Solution:

Given signature corresponds to rectangle (Opposite sides are equal).

Hence option c is correct.