Assignment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-18, 23:59 IST.

Pick the correct options from each question. There is no negative marking.

1. Which of the following is true?
   - Factor of a weak mixing system is weak mixing
   - Factor of a mixing system need not to be mixing
   - Factor of a weak mixing system need not to be weak mixing
   - Every weak mixing system is mixing
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - Factor of a weak mixing system is weak mixing

2. Which of the following is true:
   - The irrational rotation on unit circle is weakly mixing
   - The irrational rotation on unit circle is not a mixing system
   - The system defined by the map $f : [0, 1] \to [0, 1]$ defined as $f(x) = \frac{\pi}{\sqrt{2}} x \bmod 1$ is weakly mixing
   - A mixing system need not to be sensitive
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - The irrational rotation on unit circle is a mixing system

3. Which of the following system(s) are Li-Yorke Chaotic?
   - The Shift System, $\left(\mathbb{Z}, \tau \right)$
   - The Tent map
   - The Argument Doubling map
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - The Shift System, $\left(\mathbb{Z}, \tau \right)$, $\left(\mathbb{Z}^2, \tau \right)$
   - The Argument Doubling map

4. Which of the following is true:
   - A weak mixing system may contain an isolated point
   - The proximal relation is an equivalence relation
   - An asymptotic pair is always proximal
   - A proximal pair is always asymptotic
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - An asymptotic pair is always proximal

5. Suppose $x$, $y$ is a dynamical system, then:
   - If $x$, $y$ is minimal then backward orbit of every point is dense in $X$
   - If $x$, $y$ is minimal then backward orbit of a point need not to be dense in $X$
   - If a point $x$ has a dense backward orbit then it's forward orbit must also be dense
   - If a point $x$ has a non-empty pre-image has a dense forward orbit then it's backward orbit must also be dense
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - If $x$, $y$ is minimal then backward orbit of every point is dense in $X$
   - If $x$, $y$ is minimal then backward orbit of a point need not to be dense in $X$
   - If a point $x$ has a dense backward orbit then it's forward orbit must also be dense
   - If a point $x$ has a non-empty pre-image has a dense forward orbit then it's backward orbit must also be dense

6. Which of the following is true:
   - A strongly transitive system is always minimal
   - A minimal system is always very strongly transitive
   - A minimal system need not to be strongly transitive
   - A strongly transitive system need not to be minimal
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - A minimal system is always very strongly transitive
   - A strongly transitive system need not to be minimal

7. Which of the following is true:
   - A strongly transitive invertible system is always sensitive
   - A strongly transitive invertible system is always Li-Yorke chaotic
   - A strongly transitive invertible system always has a dense set of periodic points
   - A strongly transitive invertible system is always very strongly transitive
   - No, the answer is incorrect.

   Score: 0
   Accepted Answers:
   - A strongly transitive invertible system is always very strongly transitive