Assignment 8 - Objective

The due date for submitting this assignment has passed. **Due on 2020-04-22, 23:59 IST.** As per our records you have not submitted this assignment.

1) State whether True or False. Let \( C[0, 1] \) be the space of all continuous real valued functions on \([0, 1]\). For any continuous function \( K : [0, 1] \times [0, 1] \to \mathbb{R} \), the map \( T_K : C[0, 1] \to C[0, 1] \) defined as

\[
T_K(f)(x) = \int_0^1 K(x, y)f(y) \, dy, \quad x \in [0, 1],
\]

is a linear map.

- True
- False

No, the answer is incorrect. Score: 0

Accepted Answers: True

2) Let \( V \) be an inner product space and \( \{u, v\} \) be an orthonormal set. Then for any \( \lambda \in [0, 1] \), which of the following is an orthonormal set?

- \( \{\sqrt{1 - \lambda}u + \sqrt{\lambda}v, \sqrt{1 - \lambda}u - \sqrt{\lambda}v\} \)
- \( \{(1 - \lambda)u + \lambda v, (1 - \lambda)u - \lambda dv\} \)
- \( \{\sqrt{1 - \lambda}u + \sqrt{\lambda}v, \sqrt{1 - \lambda}v - \sqrt{\lambda}u\} \)
- None of the above

No, the answer is incorrect. Score: 0
3) State whether True or False.
Any one-one linear map from \( C[0, 1] \) to itself is also onto.

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers: False

4) State whether True or False.
For every abstract nonzero vector space \( V \) over \( \mathbb{R} \), there exists a function \( \langle \cdot, \cdot \rangle : V \times V \rightarrow \mathbb{R} \) such that \( (V, \langle \cdot, \cdot \rangle) \) is an inner product space.

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers: True