Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2018-09-05, 23:59 IST.

The following questions have one or more answers. Find them.

1) For a Hermitian matrix, eigen values are always

- non-zero
- integral
- positive
- real

No, the answer is incorrect.

Score: 0

Accepted Answers:
real

2) If \( Q^{-1} A Q = B \), then \( \det A \)

- = \( \det B \)
- = - \( \det B \)
- > \( \det B \)
- < \( \det B \)

No, the answer is incorrect.

Score: 0

Accepted Answers:
\( = \det B \)

3) If \( Q^{-1} A Q = B \), then trace of \( A \)

1 point
4) The relationship in question 3 holds for transformation matrices in reducible, but not in irreducible representations

- irreducible, but not in reducible representations
- irreducible representations of dimensionality \( \geq 2 \)
- reducible as well as irreducible representations

No, the answer is incorrect.

Score: 0

Accepted Answers:
- reducible as well as irreducible representations

5) If \( Q^{-1} A Q = B \) and the transformation is a unitary transformation, then the matrix/matrices that MUST be unitary is/are

- \( A \)
- \( Q \)
- \( B \)
- \( Q, A \) and \( B \)

No, the answer is incorrect.

Score: 0

Accepted Answers:
- \( Q \)

6) \( C \) is the transformation matrix for rotation of the co-ordinates of a point by 120° while \( D \) is that for rotation of base vectors by the same angle. \( C \) is

- transpose of \( D \)
- inverse of \( D \)
- the same as \( D \)
- inverse of transpose of \( D \)

No, the answer is incorrect.

Score: 0

Accepted Answers:
- the same as \( D \)

7) \( O_R f(x', y', z') = O_R f(x,y,z) \) = \( f(x,y,z) \) > \( f(x,y,z) \) = \( f(x,y,z) \) < \( f(x,y,z) \)

No, the answer is incorrect.

Score: 0

Accepted Answers:
= \( f(x,y,z) \)

8) Transformation operators produce a unitary transformation
Only for basis consisting of position vectors
for orthonormal basis functions
for all kinds of basis functions
only for basis consisting of momentum vectors

No, the answer is incorrect.
Score: 0

Accepted Answers:
for all kinds of basis functions