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NPTEL

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Courses » Engineering Mathematics - I

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Unit 12 - Week 10 :

Register for Certification exam

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Assignment 10

The due date for submitting this assignment has passed. **Due on 2019-04-10, 23:59 IST**
As per our records you have not submitted this assignment.

1) Let *1 point*

$$A = \begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}.$$

Eigenvalues of A are _____

a. $-3, -3, 5.$
b. $\pm 3, 5.$
c. $3, \pm 5.$
d. $\pm 3, -5$

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:
a

2) *1 point*

Let $A = \begin{bmatrix} 8 & -21 \\ 3 & -8 \end{bmatrix}$. One of the eigenvectors of A is _____.

a. $\begin{bmatrix} 3 \\ 6 \end{bmatrix}$
b. $\begin{bmatrix} 3 \\ 7 \end{bmatrix}$
c. $\begin{bmatrix} 6 \\ 3 \end{bmatrix}$
d. $\begin{bmatrix} 7 \\ 3 \end{bmatrix}$

- a

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Assignment Solution

Accepted Answers:
d

3) Consider *1 point*

$$A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{bmatrix}.$$

Using Cayley-Hamilton theorem,

$$A^8 - 5A^7 + 7A^6 - 3A^5 + A^4 - 5A^3 + 8A^2 - 2A + I =$$

a. $A^2 + A - I$
b. $A^2 - A + I$
c. $A^2 + A + I$
d. $A^2 - A - I$

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

4) *1 point*

Let

$$M = \begin{bmatrix} 1 & 1+3i & 5i & 7 \\ 1-3i & 4 & 3 & 6-i \\ -5i & 3 & 7 & i \\ 7 & 6+i & -i & 0 \end{bmatrix}, \text{ then}$$

a. M has purely imaginary eigen values.
b. M has only real eigenvalues.
c. M is not diagonalizable.
d. M has eigenvalues which are neither real nor purely imaginary.

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

5) Let A be skew-symmetric matrix of odd order. Then, *1 point*

$$detA = \_\_\_\_\_.$$

a. 0
b. 1
c. -1
d. 2

- a

b
c
d

No, the answer is incorrect.
Score: 0

Accepted Answers:
a

6) **1 point**

Let

$$A = \begin{bmatrix} 7 & 4 & -1 \\ 4 & 7 & -1 \\ -4 & -4 & 4 \end{bmatrix}.$$

Dimension of the eigenspace corresponding to the smallest eigenvalue is

a. 1
b. 2
c. 3
d. 0

a
b
c
d

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

7) **1 point**

The matrix $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$

a. is diagonalizable.
b. is not diagonalizable.
c. has purely imaginary eigenvalues.
d. has two distinct eigenvalues.

a
b
c
d

No, the answer is incorrect.
Score: 0

Accepted Answers:
b

8) **1 point**

Let $P = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ and $D = \begin{bmatrix} 2 & 0 \\ 0 & -2 \end{bmatrix}$. If $A = PDP^{-1}$, then A^5 is

a. $\begin{bmatrix} 8 & 12 \\ 0 & -5 \end{bmatrix}$

b. $\begin{bmatrix} 32 & 0 \\ 0 & -32 \end{bmatrix}$

c. $\begin{bmatrix} 32 & -192 \\ 0 & -32 \end{bmatrix}$

d. $\begin{bmatrix} 32 & -96 \\ 0 & -32 \end{bmatrix}$

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

9) The value of t so that $\begin{bmatrix} 4 \\ -1 \end{bmatrix}$ is an eigenvector of $\begin{bmatrix} 3 & 4 \\ 2 & t \end{bmatrix}$ is *1 point*

a. -1
b. 2
c. 10
d. 5

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:
c

10) *1 point*

$A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$ is similar to $B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$. Which of the following statements is inco

a. The eigenvalues of B are 1,2,3.
b. The eigenvalues of A are 3,5,7.
c. The characteristic polynomial for A is $-\lambda^3 + 6\lambda^2 - 11\lambda + 6$.
d. The characteristic polynomial for B is $\lambda^3 - 6\lambda^2 + 11\lambda - 6$.

- a
- b
- c
- d

No, the answer is incorrect.
Score: 0

Accepted Answers:

b

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