رياضيات 2
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أ.د. فتحى هشام

Faculty of Computers & Information, Assiut University
1st Level
Final Exam
Duration: 2 hours

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* الإسم الرباعي (بالعربي فقط)

نرمين محب خير عوض الله

2

* رقم الجلوس

162020677

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المستوي *

- الاول
- الثاني
- الثالث
- رابعة 2013
- رابعة 2014
- رابعة 2015
- رابعة 2016
- رابعة 2017

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البرنامج *

- عام
- بايو
- هندسة

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رقم المعمل *

- ج.
- د.

- اب
- اد
- اهـ
- أ٢
- ب٢
- ج٢
- د٢
- هـ٢
- أ٣
- ب٣
- ج٣
- د٣
- هـ٣
- أ٤
- ب٤

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* رقم الكمبيوتر

19

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* الكود (قد تمت مراجعة بيانات الطالب ورقم الجلوس)

JF4d

8

السؤال
(2 Points)

The partial fraction decomposition of $\frac{2}{x^2-1}$ is

(a) $\frac{1}{x-1}+\frac{1}{x+1}$ (b) $\frac{1}{x-1}-\frac{1}{x+1}$ (c) $\frac{1}{x+1}$ --

a

b

c

9

السؤال
(2 Points)

Which statement about the set S is false where $S=\{(1,1,3),(2,3,7),(2$

a. The set S is linearly independent.
b. The set S contain an element which is solution of the equation 5:
c. The set S contain two elements, which are multiple of each other
d. The set S is linearly dependent.

a

b

c

d

10

السؤال
(2 Points)

The augmented matrix of the system of equations

$$2x+3y-2z=0$$
$$6x+6y+4z=6$$
$$-4x-9y+6z=2$$

in reduced row echelon form is

(a) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1/3 \\ 0 & 0 & 1 & 2 \end{array}\right]$

(b) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -1/3 \\ 0 & 0 & 1 & 1/2 \end{array}\right]$

(c) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & -1/2 \end{array}\right]$

(d) none of these.

a

b

c

d

11

السؤال
(2 Points)

The augmented matrix of the system of equations

$$x+y+z=a$$
$$x+2y+2z=0$$
$$2x+3y+3z=a$$

in reduced row echelon form is

(a) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & -2a \\ 0 & 1 & 1 & -a \\ 0 & 0 & 0 & 0 \end{array}\right]$

(b) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & -2a \\ 0 & 1 & 1 & -a \\ 0 & 0 & 1 & 0 \end{array}\right]$

(c) $\left[\begin{array}{ccc|c} 1 & 0 & 0 & -2a \\ 0 & 1 & 0 & -a \\ 0 & 0 & 0 & 0 \end{array}\right]$,

(d) none of these.

a

b

c

d

12

السؤال
(2 Points)

Is the function $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} x^2 + y^2 \\ x\,y \end{bmatrix}$ is

(a) a linear transformation $T: R^2 \to R^2$

(b) not a linear transformation $T: R^2 \to R^2$

(c) not applicable.

- a
- b
- c

13

السؤال
(2 Points)

Is the set $U = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} : 2x + 3y = 0 \right\}$

(a) a subspace of R^2

(b) not a subspace of R^2

(c) not applicable.

- a
- b
- c

14

السؤال
(2 Points)

Let V be a vector space, and let S be a subset of V. What does it mean we say that S is linearly independent?

a. All the elements of S are distinct from each other.
b. S has nullity zero.
c. The only way to write 0 as a linear combination of elements of S is t
combination (where one takes zero multiples of each element of S)
d. S is closed under both addition and scalar multiplication.

- a
- b
- c
- d

15

السؤال
(2 Points)

If the order of matrix A is $m \times p$ and the order of B is $p \times n$. Then
of matrix AB is

(a) $m \times n$ (b) $n \times m$ (c) $n \times p$ (d) m

- a
- b
- c
- d

16

السؤال
(2 Points)

State the type of partial fraction $\frac{6x+5}{(2x-1)^2}$

a. linear factor.

b. repeated fact

c. quadratic factor.

d. improper fra

- a
- b
- c
- d

17

السؤال
(2 Points)

The system of equations

$$x-y-z=4$$
$$2x-2y-2z=8$$
$$5x-5y-5z=20$$

has:

a) Unique Solution

b) No solution

c) Infinitely many Solutions

d) Finite solutions

- a
- b
- c
- d

18

السؤال
(2 Points)

The reduced form of the Matrix in Gauss Elimination method is als

a) Column Echelon Form

b) Row-Column Echelon Form

c) Column-Row Echelon Form

d) Row Echelon Form

- a
- b
- c
- d

19

السؤال
(2 Points)

Is the function $\langle u, v \rangle = 5u_1v_1 + 4u_2$

(a) inner product on R^2

(b) not inner product on R^2

(c) not applicable .

- a
- b
- c

20

السؤال
(2 Points)

If $A = \begin{bmatrix} -1 & -1 & 2 \\ 2 & 1 & -2 \\ 1 & 1 & -1 \end{bmatrix}$, then $A^{-1} =$

(a) $\begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 1 & 1 \end{bmatrix}$

(b) $\begin{bmatrix} 1 & 1 & 0 \\ 1 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 1 & 0 \\ 0 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$

(d) none of these.

- a
- b
- c
- d

21

السؤال
(2 Points)

What is true regarding Determinant of a Matrix?

a. The concept of determinant is applicable to square matrices only.
b. To find determinant, subtract diagonal elements together.
c. determinant is a vector value that can be computed from the elemer
Trace matrix
d. Both a and c

- a
- b
- c
- d

22

السؤال
(2 Points)

The element a_{ij} of any matrix A is present in

(a) i^{th} row and j^{th} column

(b) i^{th} column and j^{th} row

(c) $(i+j)^{th}$ row and column

(d) $(i-j)^{th}$ row and column

- a
- b
- c
- d

23

السؤال
(2 Points)

If determinant of a matrix is equal to zero, then it is sa

(a) square matrix

(b) singular matrix

(c) non-singular matrix

(d) identical matrix

- a
- b
- c
- d

24

السؤال
(2 Points)

Solve the equations using Gauss Jordan method.

$$2x-3y+z=-1$$
$$x+4y+5z=25$$
$$3x-4y+z=2$$

(a) $x=1, y=3, z=4$

(b) $x=1, y=3, z=5$

(c) $x=1, y=3, z=7$

(d) $x=1, y=3, z=2$

- a
- b
- c

d

25

السؤال
(2 Points)

The aim of elimination steps in Gauss elimination method is to r
the coefficient matrix to

a) diagonal

b) identity

c) lower triangular

d) upper triangular

a

b

c

d

26

السؤال
(2 Points)

Let A; B; C be square invertible matrices satisfying $AB = B^2C$. that $\det B = 3$ and $\det C = 2$. Find a formula for A and calculate determinant of A.

a. $A = BC$, $\det A = 6$.

b. $A = B^3C$, $\det A = 11$.

c. $A = B^2CB^{-1}$, $\det A = 6$.

d. $A = B^2CB^{-1}$, $\det A = 5$.

- a
- b
- c
- d

27

السؤال
(2 Points)

Solve the equations using Gauss Jordan method.

$$x + 2y + 6z = 22$$
$$3x + 4y + z = 26$$
$$6x - y - z = 19$$

(a) $x = 2, y = 3, z = 4$

(b) $x = 4, y = 2, z = 3$

(c) $x = 4, y = 3, z = 2$

(d) $x = 3, y = 4, z = 2$

- a
- b
- c
- d

28

السؤال
(2 Points)

What is 'a', if $B = \begin{bmatrix} 1 & 4 \\ 2 & a \end{bmatrix}$ is a singular matrix ?

(a) 5 (b) 6 (c) 7

- a
- b
- c
- d

29

السؤال
(2 Points)

If $\begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \\ a_{31} & a_{32} \end{bmatrix} A = \begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{bmatrix}$, then order of matrix A

(a) 2 x 2 (b) 2 x 3 (c) 3 x 2 (d

- a
- b
- c
- d

30

السؤال
(2 Points)

The augmented matrix of the system of equations

$$\begin{aligned} x_1 + 2x_2 + 3x_3 &= 0 \\ 2x_1 - x_2 + x_3 &= 0 \\ x_1 - 5x_2 - 4x_3 &= 0 \end{aligned}$$

in the **row-echelon form** is

(a) $\left[\begin{array}{ccc|c} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]$

(b) $\left[\begin{array}{ccc|c} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{array}\right]$

(c) $\left[\begin{array}{ccc|c} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 3 \end{array}\right]$

(d) none of these.

- a
- b
- c
- d

31

السؤال
(2 Points)

Which of the following equations is a variable separable

a. $(x + x^2 y)dy = (2x + xy^2)dx$

b. $(x + y)dx - 2ydy = 0$

c. $2ydx = (x^2 + 1)dy$

d. $y^2 dx + (2x - 3y)dy = 0$

- a
- b
- c
- d

32

السؤال
(2 Points)

The correct form of the partial fraction decomposition for $\frac{1}{x^3-5x^2-}$

(a) $\frac{A}{x}+\frac{B}{x^2-5x-6}$ (b) $\frac{A}{x}+\frac{Bx+C}{x^2-5x-6}$ (c) $\frac{A}{x}+\frac{B}{x-6}+\frac{}{x}$

- a
- b
- c

33

السؤال
(2 Points)

Is the set $S=\{1, x+1, x^2-x\}$ a base for

(a) R^2

(b) P_2

(c) P_3

- a
- b
- c

34

السؤال
(2 Points)

Is the function $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} \cos\ x \\ \sin\ y \end{bmatrix}$ is

(a) a linear transformation $T: R^3 \to R^2$

(b) a linear transformation $T: R^2 \to R^2$

(c) a linear transformation $T: R^2 \to R^3$

(d) none of these.

- a
- b
- c
- d

35

السؤال
(2 Points)

The solution (x, y, z) of the system

$$\begin{aligned} 2x + y \quad + z &= -6 \\ x + 5y + 2z &= 3 \\ -3x + 2y + 3z &= -3 \end{aligned}$$

is

(a) $(2, -3, 5)$.

(b) $(-2, 3, 5)$.

(c) $(-2, 3, -5)$.

(d) none of these.

- a
- b
- c
- d

36

السؤال
(2 Points)

In Gaussian elimination method, original equations are transformed

a) Column operations

b) Row Operations

c) Mathematical Operations

d) Subset Operation

- a
- b
- c
- d

37

السؤال
(2 Points)

Solve the differential equation $dy - xdx = 0$ when $y(1$

a. $3x^2 + 2y - 3 = 0$

b. $2y^2 + x^2 - 1 = 0$

c. $x^2 - 2y - 1 = 0$

d. $2x^2 + 2y - 2 = 0$

- a

b

c

d

38

السؤال
(2 Points)

With $B=\begin{bmatrix}-1 & 2\\ 2 & 1\\ -1 & 2\end{bmatrix}$, $C=\begin{bmatrix}0 & -2\\ 3 & 1\\ 2 & -3\end{bmatrix}$, $D=\begin{bmatrix}-1 & 4 & 2\\ 2 & 0 & 1\end{bmatrix}$, $E=\begin{bmatrix}2 & 3 & 1\\ 2 & 0 & 0\end{bmatrix}$

We have $(2B-C)(3D-E))=$

(a) $\begin{bmatrix}34 & -8 & 8\\ -1 & 9 & 8\\ 48 & -36 & 1\end{bmatrix}$

(b) $\begin{bmatrix}34 & -18 & 8\\ -1 & 9 & 8\\ 48 & -36 & 1\end{bmatrix}$

(c) $\begin{bmatrix}34 & -18 & 8\\ -1 & 9 & 8\\ 48 & -6 & 1\end{bmatrix}$

(d) none of these.

a

b

c

d

39

السؤال
(2 Points)

· The system of equations

$$\begin{aligned} x_1 + 2x_2 \quad + x_3 &= a\\ 2x_1 \quad + x_2 \quad - x_3 &= b\\ -4x_1 \quad + x_2 \quad + 5x_3 &= c \end{aligned}$$

is consistent if

(a) $-2a+3b+c=0$

(b) $-2a+3b+c\neq 0$

(c) $-2a+3b+4c=0$

(d) none of these.

a

b

c

d

40

السؤال
(2 Points)

Let V be a vector space, and let W be a subset of V. What does it mea
we say that W is closed under scalar multiplication?
a. Whenever x is in W and c is a scalar, then cx is in V.
b. Whenever x is in V and c is a scalar, then cx is in W.
c. If cx is in W and x is in W, then c is a scalar.
d. Whenever x is in W and c is a scalar, then cx is in W.

a

b

c

d

41

السؤال
(2 Points)

The correct form of the partial fraction decomposition for $\frac{1}{(x-4)^2(x^2+}$

is

(a) $\frac{Ax+B}{(x-4)^2}+\frac{Cx+D}{x^2+x+9}$

(b) $\frac{A}{x-4}+\frac{B}{(x-4)^2}+\frac{Cx+D}{x^2+x+9}$

(c) $\frac{A}{(x-4)^2}+\frac{B}{x^2+x+9}$

a

b

c

42

السؤال
(2 Points)

A finite set $S=\{v_1,v_2,v_3\}$ of elements of a linear space V is called

for V if:

(a) S is linearly dependent and S spans V

(b) S is linearly independent and S spans V

(c) S is linearly independent and S not spans V

a

b

c

43

السؤال
(2 Points)

State the type of partial fraction $\frac{125+4x-9x^2}{(x-1)(x+3)(x+4}$

a. linear factor.

b. repeated factor.

c. quadratic factor.

d. improper fracti

a

b

c

d

44

السؤال
(2 Points)

The equation $y^2 = cx$ is general solution

a. $\frac{dy}{dx} = \frac{2y}{x}$

b. $\frac{dy}{dx} =$

c. $\frac{dy}{dx} = \frac{y}{2x}$

d. $\frac{dy}{dx} =$

- a
- b
- c
- d

45

السؤال
(2 Points)

Is the set $U = \left\{ \begin{bmatrix} a \\ b \end{bmatrix} : a+b=1 \right\}$

(a) a subspace of R^2

(b) not a subspace of R^2

(c) not applicable .

- a
- b
- c

46

السؤال
(2 Points)

Is the function $\langle u, v \rangle = 2u_1v_1 + 3u_2v_2 + 4u$

(a) inner product on R^3

(b) not inner product on R^3

(c) not applicable .

- a
- b
- c

47

السؤال
(2 Points)

The system of equations

$$\begin{aligned} 2x_1 - x_2 + x_3 &= a \\ x_1 + x_2 - x_3 &= b \\ 7x_1 - 2x_2 + 2x_3 &= c \end{aligned}$$

is consistent if

(a) $a - 3b + c = 0$

(b) $a - 3b + c \neq 0$

(c) $-3a - b + c = 0$,

(d) none of these.

- a
- b

c

d

48

السؤال
(2 Points)

Solve this system of equations and comment on the nature of the sc using Gauss Elimination method.

$$x + y + z = 0$$
$$-x - y + 3z = 3$$
$$-x - y - z = 2$$

a) Unique Solution

b) No solution

c) Infinitely many Solutions

d) Finite solution

a

b

c

d

49

السؤال
(2 Points)

The base for the subspace $U=\left\{\begin{bmatrix}a\\b\\c\end{bmatrix}: a+b+c=0\right\}$ of R^3 is:

(a) $\begin{bmatrix}1\\-1\\0\end{bmatrix}, \begin{bmatrix}0\\-1\\1\end{bmatrix}$

(b) $\begin{bmatrix}1\\0\\-1\end{bmatrix}, \begin{bmatrix}0\\1\\-1\end{bmatrix}$

(c) $\begin{bmatrix}-1\\0\\1\end{bmatrix}, \begin{bmatrix}-1\\1\\0\end{bmatrix}$

(d) all of these

- a
- b
- c
- d

50

السؤال
(2 Points)

The order of the differential equation $2x^2\frac{d^2y}{dx^2}-3\frac{dy}{dx}+y=$

a. 2 b. 1 c. 0 d. not

- a
- b
- c
- d

51

السؤال
(2 Points)

Let V be the set of all 2-vectors whose components as follows:

$V = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} : x + y = 0 \right\}$, the set V is nonempty since :

(a) $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ is an element of V

(b) $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$ is an element of V

(c) $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ is an element of V

- a
- b
- c

52

السؤال
(2 Points)

Let V be a vector space, and let W be a subset of V. What does it me we say that W is closed under addition?

a. Whenever x and y are in V, then $x + y$ is in W.
b. Whenever x and y are in W, then $x + y$ is in W.
c. Whenever x and y are in W, then $x + y$ is in V.
d. Every vector in W is the sum of two vectors in W.

- a
- b
- c
- d

53

السؤال
(2 Points)

The augmented matrix of the system of equations

$$\begin{aligned} 2x_1 + 4x_2 - 4x_3 &= 3 \\ x_1 + 8x_2 + 2x_3 &= 7 \\ 2x_1 + x_2 + x_3 &= 2 \end{aligned}$$

in the **row-echelon form** is

(a) $\left[\begin{array}{ccc|c} 1 & 5 & 2 & 7 \\ 0 & 1 & \frac{2}{3} & \frac{11}{12} \\ 0 & 0 & 1 & \frac{1}{4} \end{array}\right]$

(b) $\left[\begin{array}{ccc|c} 1 & 8 & 5 & 7 \\ 0 & 1 & \frac{2}{3} & \frac{11}{12} \\ 0 & 0 & 1 & \frac{1}{4} \end{array}\right]$

(c) $\left[\begin{array}{ccc|c} 1 & 8 & 2 & 5 \\ 0 & 1 & \frac{2}{3} & \frac{11}{12} \\ 0 & 0 & 1 & \frac{1}{4} \end{array}\right]$

(d) none of these.

- a
- b
- c
- d

54

السؤال
(2 Points)

Solve the given system of equation by Gauss Elimination method.

$$\begin{aligned} 3x + 4y - z &= -6 \\ -2y + 10z &= -8 \\ 4y - 2z &= -2 \end{aligned}$$

(a) $(-2,-1,-1)$

(b) $(-1,-2,-1)$

(c) $(-1,-1,-2)$

(d) $(-1,-1,-1)$

- a
- b
- c
- d

55

السؤال
(2 Points)

If A and B are matrices, then which from the following is

(a) $A + B \neq B + A$

(b) $(A^t)^t \neq A$

(c) $AB \neq BA$

(d) all are true

- a
- b
- c
- d

56

السؤال
(2 Points)

Solve the linear differential equation $\frac{dy}{dx} + \frac{y}{x} = x$

a. $xy^2 = \frac{x^3}{4} + C$

b. $xy = \frac{x^4}{4} + C$

c. $x^2y = \frac{x^4}{4} + C$

d. $y = \frac{x^3}{4} + C$

- a
- b
- c
- d

57

السؤال
(2 Points)

Is the function $T\left(\begin{bmatrix} a \\ b \\ c \end{bmatrix}\right) = \begin{bmatrix} 3a+c \\ b-2c \end{bmatrix}$ is

(a) a linear transformation $T: R^3 \to R^2$

(b) a linear transformation $T: R^2 \to R^3$

(c) not applicable.

- a
- b
- c