MCQ1: Let w
and v be vector spaces. A function
T: V → W is called a linear transformation from v to w if for all x
   and scalar K

I.

   =
Answer: I and II

FBQ1: Let T:U→V be a linear transformation, defined btTU=0 ∀ u∈U. Then we call T a __________________________
Answer: Null zero transformation

FBQ2: If U and V are two vector spaces over a field F and T:U→V is a bijection linear transformation. Then we say U and V are ………………………………..
Answer: Isomorphic

FBQ3: Another name for linear transformation is …………………………………………
Answer: Vector space homomorphism

FBQ4: The rank of a linear transformation T is defined to be ……………………………….
Answer: Dimension R(T)

FBQ5: Suppose U is a vector space over a field F, and T is an identity transformation, then the function T:U→U will be defined by __________________________________
Answer: T(u)=U

FBQ6: A homomorphism theorem states that if v and w are vector spaces over a field F and T:VT:V→W is a linear transformation. Then VKer T _______________________
Answer: R(T)

FBQ7: The nullity of T= ___________
Answer: Dimension of ker T

FBQ8: A linear transformation T:U→U is called _________________ if each v∈V, there exists u∈U such that Tu=v that RT=V.
Answer: Subjective

FBQ9: Two finite –dimensional vectors U and V are isomorphic if and only if ________________
Answer: Dimension of U= Dimension of V

FBQ10: Let U,V be vector spaces over a field F of dimension m and n respectively, then L(U, V) is a vector of dimension _______
Answer: Mn

FBQ11: L(R2, R) is a real vector space of dimension _______
Answer: 2

FBQ12: Let U be a vector space over F, then the space L(U, F) is called the _________of U
Answer: Dual space

FBQ13: A transformation on T:U→F is called __________
Answer: Linear function

FBQ14: The basis f1,f2, …, fm of V is called the ___________ of the basis e1,e2, …, em of V
Answer: Dual basis

FBQ15: A polynomial Px=a0+a1x+…+an-1xn-1+xn is called ________

Answer: Monic polynomial

FBQ16: A … is a sequence in which each successive terms of the sequence are in equal ratio.
Answer: geometric progression

FBQ17: For T∈AV, the unique monic polynomial P of the smallest degree such that PT=0 is called _____ T
Answer: Minimal polynomial

FBQ18: The division algorithm states that given f(x) and p(x), there exist polynomial g(x) and h(x) such that _____ hx=0
Answer: F(x)=p(x)g(x)+h(x)

FBQ19: For any vector space V, the minimal polynomials for the identity transformation and the zero transformation are x-1 and _____
Answer: X

FBQ20: Every vector space is isomorphic to its _____
Answer: Second dual

FBQ21: The degree of the polynomial (x2-1) is _____
Answer: 4

FBQ22: The matrices are said to be equal if they are of the _____
Answer: Same order and element

FBQ23: A square matrix A such At=A is called a _____
Answer: Symmetric matrix

FBQ24: A square matrix A such At=-A is called a _____
Answer: Anti- symmetric matrix

FBQ25: A matrix obtained by replacing each of its entry by complex conjugate is called …….
Answer: Conjugate matrix

FBQ26: In conjugate matrix, A-=A- if only if A is a called _____
Answer: Real matrix

FBQ27: Given a matrix A∈Mm×nF, the matrix formed by taking conjugate of matrixAt is called _____
Answer: Conjugate transpose of A

FBQ28: A square matrix A for which A-t is called _____
Answer: Hermitian matrix

FBQ29: A square matrix A for which A-t=-A is called _____
Answer: Skew- Hermitian matrix

FBQ30: The conjugate of 1123 is ……
Answer: Its self

FBQ31: For a real matrix A, A is Hermitian if A is …….
Answer: Symmetric

FBQ32: For a real matrix A, A is skew-Hermitian if A is …….
Answer: Skew- symmetric

FBQ33: A matrix whose entries along the diagonal are non-zero is called …….
Answer: Diagonal matrix

FBQ34: A square matrix A∈MnF is said to be _____ if there exists B∈MnF

such that B=BA= In
Answer: Invertible

FBQ35: The integer PcA=PrA is called _____ of A, and is denoted by PA.
Answer: Rank

FBQ36: A matrix obtained by subjecting 1n to an elementary row or column operation is called _____
Answer: Elementary matrix

FBQ37: A m×n matrix A with the following properties (i) The non-zero rows come before the row(ii) In each non-zero row, the first non-zero entry is 1.(iii) The first non-zero entry in every non-zero row (after the first row) is to the right of the first non-zero entry in the preceeding row is called……..
Answer: Row-reduction echelon matrix

FBQ38: If E is a row-reduction echelon form of A. Then, the rank of A is …….
Answer: Number of non-zero rows of E

FBQ39: Consider a matrix A=2513, its determinant is _____
Answer: 1

FBQ40: The determinant rank of m×n matrix A is equal to the _____
Answer: Rank of A

FBQ41: The rank of A=1425 is _____
Answer: 2

FBQ42: If A=126541732,then, the determinant of A is _____
Answer: -13

FBQ43: If A is a linear transformation represented by a matrix A and there is a vector X∈Rn ≠0 such that AX=λX, for some scalar λ, then is called _____
Answer: Eigen value

FBQ44: For an eigenvalue λ of T, the non-zero subspace W λ is called the _____ of T associated with eigenvalue.
Answer: Eigen value

FBQ45: The eigenvalue for the linear operator T:R3→R3 such that Tx, y,z=2x, 2y,2z is _____
Answer: 2

FBQ46: A linear transformation T:V→V on a finite dimensional vector V is said to be _____if there exist a basis B=v1,v2, …,vn of V such that the matrix of T with respect to the basis B is diagonal.
Answer: Diagonalisable

FBQ47: The _____ of a matrix A over F is the monic polynomial p(t) such that (i) PA=0 and (ii) if q(t) is non-zero polynomial over F such that degq<degp, then qA≠0.
Answer: Minimal polynomial

FBQ48: The determinant of A=sinθ-cosθcosθsinθ is _____
Answer: 1

FBQ49: If A=1020, then PrA is _____
Answer: 2

FBQ50: If B=-iiii, where i is a complex value, then |B|2 is _____
Answer: 4

MCQ1: Let w and v be vector spaces. A function T: V → W is called a linear transformation from v to w if for all x x,y∈V and scalar K T(x+y) = Tx+T(y) TKx=KT(x)
Answer: I and II

MCQ2: Which of the following is linear
Answer: F: R→ R defined in by fx=2x

MCQ3: Which of the following is not a linear transformation?
Answer: None of the options

MCQ4: Given a linear transformation T: U→ V, which of the following is true?
Answer: All of the options

MCQ5: Which of the following is true for this linear transformation T: U→ V is one – one if and only if kerT = (0) onto if and only R(T)=V
Answer: I and II

MCQ6: Two finite-dimensional vectors space U and V are isomorphic if and only if
Answer: Dim U = dim V

MCQ7: In the rank unity theorem, Dim V – nullity (ST) = DIM V – nullity (T) – DIM R((T) ∩ kerS) which implies
Answer: Nullity (ST) = nullity (T) + dim (R(T) ∩ kerS)

MCQ8: The minimal polynomial of a matrix A over f is the monic polynomial P(t) such that I.P(a) = 0II.If q(t) is a non-zero polynomial over F such that deg q < deg p, q(A) ≠ 0 Which of the following is property of minimal polynomial?
Answer: I and II

MCQ9: If the characteristic polynomial T:R4→R4 is (t+1)2(t-2)2, then the minimal polynomial could be
Answer: (t+1)(t+2)

MCQ10: What is the characteristic polynomial of A if 211-12-1-113
Answer: ft=t3-7t2+19t-19

MCQ11: Let 32-10, then the characteristic polynomial of A is
Answer: t2-3t+2

MCQ12: Let T:V→V be a linear transformation. A vector x∈V is an Eigen vector of the linear transformation T ifX is none zeroTx=ʎx for some scalar ʎ∈F. Which of the following is the definition of eigen vector?
Answer: I and II

MCQ13: Obtain an eigen value for the linear operator T:R^3→R^3 by T(x,y,z)=(2x,2y,2z)
Answer: 2

MCQ14: Two matrices are said to be equal if I.They have the same size. i.e, they have the same numbers of rows as well as columnsII.Their elements at all the corresponding positions are the same.Which of the following qualify the definition of equal matrices?
Answer: I and II

MCQ15: Find the eigen values of 2221
Answer: 0, 3

MCQ16: Describe T:R3→R3 such that T]B = 124231312, where B is the standard basis of R3
Answer: Tx,y,z=(x+2y+4z, 2x+3y+z, 3x+y+2z)

MCQ17: Calculate 312+ 01

Answer: 39

MCQ18: If A is an upper triangular 3×3 matrix, say A = 123045006. Therefore At is
Answer: Lower triangular

MCQ19: A matrix A is invertible when
Answer: The determinant is zero

MCQ20: Let A = 100708009 , B = 213540 , find AB if it is defined
Answer: 21467360

MCQ26: Let U, V, W be vector spaces over F. Suppose S∈L(v,w) and T∈L(u,v), then we have
Answer: S∘T∈L(u,w)

MCQ27: Let T:R2→R3 and S:R3→R2 be defined by Tx1,x2=x1,x2, x1+x2 and Sx1,x2,x3=x1,x2. Then one of the following is true
Answer: S∘T≠T∘S

MCQ28: The required polynomial for any vector space V, the minimal polynomial for identity I and 0 the zero transformation is
Answer: x-1and x

MCQ29: The sum of matrix A and B where B is the identity matrix with respect to addition will give the matrix
Answer: Matrix 0

MCQ30: In properties of matrix addition, the equation A + B = B + A refers to
Answer: Commutative

MCQ31: The transpose of 2 by 3 matrix will give a
Answer: 3 by 2 matrix

MCQ32: Let [aij] be a square matrix, then the entries a11, a12,a13, …,a1n are called
Answer: The diagonal entries of A

MCQ33: The conjugate of (2 3+i i) is
Answer: (2 3-i -i)

MCQ34: For a matrix A = 1220, we have the following except
Answer: A=AT

MCQ35: Find det(T) where we defined T : R3→R3 by T(x1, x2, x3) = (3x1 + x3, -2x1 +x2,-x + 2 ×2 + 4x3)
Answer: 9

MCQ36: Obtain the cofactor C12 of the matrix A = 02-1341216
Answer: -16

MCQ37: Given A = 102310001 and B = 2109038005. Calculate |AB|
Answer: 30

MCQ38: If A = 100120, find Pr (A)
Answer: 2

MCQ39: Let T : R2→R2be defined by Tx,y=(x,-y) for all x,y∈R. Show that T is a linear transformation
Answer: T(x1 + y1) +β(x2 + y2)) =αT(x21 + y1) + βT(x2 + y2)

MCQ40: If Let T:U→V is one - one and onto linear transformation, then we can have
Answer: T-1:V→U

MCQ41: Obtain the determinant rank of A=1425
Answer: 2

MCQ42: Obtain the characteristic polynomial of the matrix 120-1
Answer: t2-1

MCQ43: The minimal polynomial of A=02-1341216 is either
Answer: (t-1)(t-2) or (t-1)(t-2)

MCQ44: Let U and V be finite dimensional vector space over F and T:U→V be a linear transformation, then rank (T) + nullity (T) = ?
Answer: dim U

MCQ45: Let T:U→V be a linear transformation, then Tis 1-1 . if T(U1) = T(U2) implies that
Answer: U1= U2

MCQ46: A matrix having three horizontal rows and four vertical columns is called
Answer: 4 by 4 matrix

MCQ47: If 1023=xyz3, find x, y and z
Answer: x=1, y=0,z=2

MCQ48: What is the sum of 1001 and -100-1
Answer: 0000

MCQ49: Calculate 2B, where B=121413000
Answer: 11223000

MCQ50: Calculate 312
Answer: 36

MCQ21: Let e1=0,1,0 and e2=0,0,1 form the standard basis of R3. Let 1,2,2,3 and 3,4 be three vectors in R2. Obtain the linear transformation T:R3→R2 such that T(e1)=1,2, T(e2)=2,3 and T(e3)=3,4
Answer: Tx1,x2,x3=(x1+2x2+3x3, 2x1+3x2+4x3)

MCQ22: Given T:U→V is one – one if and only if
Answer: KerT = (0)

MCQ23: Given a linear transformation T:U→V is onto if and only if
Answer: RT= kerV

MCQ24: Let S, T ∈L(u,v) where S and Tare linear transformation. We define S+T:U→V by (S+T)U=
Answer: Su+T(u)

MCQ25:
Answer: