**D.Y. PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

**22SYAIML201301**

**Q. Paper Code:**

**KASABA BAWADA KOLHAPUR-416006**

**(An Autonomous Institute)**

**S. Y. B. Tech. (Semester-III)**

**END SEMESTER EXAMINATION, OCT./NOV.- 2021-22**

**COURSE NAME:** Linear Algebra, **COURSE CODE:** 201AIMLL201

Seat No :

**Day and Date: Saturday, 05.02.2022**

**Time: 10.00 am to 11.00 Max. Marks- 50**

**OBJECTIVE**

***Instructions:***

1) Each question carries **2 marks**.

2) **Non-Programmable** Calculator is allowed.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** | |  | |  | **Correct**  **Option** |
| Q. 1) | Let V be a vector space and  be non-empty set of vectors in V. If there exist scalars all are zero such that then the set S is called as | | | A |
| A) Linearly independent set in V. | | B) Linearly dependent set in V. |
| C) Both linearly independent set in V, as well as linearly dependent set in V. | | D) None of these |
| Q. 2) | The dimension of R2 vector space is | | | B |
| A) 1 | | B) 2 |
| C) 3 | | D) 4 |
| Q.3) | Let W be subspace of vector space V, then which of the following statement is true | | | A |
| A) 1.  2. If and  are vector in W,  then is in W.  3. If k is a scalar and  is a vector in W, then is in W. | | B) 1.  2. If and  are vector in W,  then is not in W.  3. If k is a scalar and  is a vector in W, then is in W. |
| C) 1.  2. If and  are vector in W,  then is in W.  3. If k is a scalar and  is a vector in W, then is in W. | | D) 1.  2. If and  are vector in W,  then is not in W.  3. If k is a scalar and  is a vector in W, then is not in W. |
| Q. 4) | If A is any matrix, then the relation between dimension of the row space of A and column space of A is | | | C |
| A) May be same or may not be same | | B) The different dimension. |
| C) The same dimension. | | D)None of these |
| Q. 5) | If A is a matrix with n columns, then  Rank (A) + Nullity (A) is equal to | | | D |
| A) 0 | | B) 1 |
| C) infinite | | D) n |
| Q. 6) | Calculate the nullity of the matrix A, if A matrix is of order 3\*4 and  rank (A) =2 | | | C |
| A) 1 | | B) 3 |
| C) 2 | | D) 4 |
| Q. 7) | If a matrix is in row echelon form, then the column vectors that contain the leading 1’s form a basis for | | | A |
| A) The column space of that matrix | | B) The row space of that matrix |
| C) Normal form | | D)None of these |
| Q. 8) | If a setcontainszero vectors, then S is | | | C |
| A) Linearly independent | | B) Both linearly dependent as well as independent |
| C) Linearly dependent | | D) None |
| Q. 9) | The cosine angle between the vectors is | | | B |
| A) | | B) |
| C) | | D) |
| Q. 10) | If a set of vector is linearly dependent then | | |  | B |
| A) Exactly one member can be expresses as linear combination of the remaining vectors | | B) At least one member can be expresses as linear combination of the remaining vectors |
| C) No member can be expresses as linear combination of the remaining vectors | | D) None of these |
| Q. 11) | The Euclidean inner product of the vector | | | D |
| A) 10 | | B) 11 |
| C) 12 | | D)13 |
| Q.12) | Calculate the distance between  with Euclidean inner product | | | A |
| A) | | B) |
| C) | | D) |
| Q. 13) | If u and v are orthogonal vectors in an inner product space, then generalized theorem of Pythagoras is | | | A |
| A) | | B) |
| C) | | D) |
| Q. 14) |  | | | C |
| A) | | B) |
| C) | | D) |
| Q. 15) |  | | | D |
| A) -95 | | B) -99 |
| C) -97 | | D) -93 |
| Q. 16) | In a fuzzy set  The values 0.1, 0.85, 0.91, 0.9, 0.24, 0.3 are known as | | | B |
| A) Membership grads of crisp set A | | B) Membership grads of fuzzy set A |
| C) Subset of fuzzy set A | | D) None of these |
| Q. 17) | Fuzzy sets A and B given by | | | C |
| A) 0.7222 | | B) 7.98 |
| C) 0.4974 | | D) 3.97 |
| Q. 18) | Two fuzzy sets A and B defined on X are | | | A |
| A) | | B) |
| C) | | D) |
| Q. 19) | For the fuzzy set    Calculate the scalar cardinality | | | B |
| A) 0.204 | | B)2.04 |
| C) 20.4 | | D)0.0204 |
| Q. 20) | Fuzzy set A is called normal fuzzy set | | | B |
| A) If it contain an element with membership grade 0 | | B) If it contain at least one element with membership grade 1 |
| C) If it does not contain an element with membership grade 1 | | D) None of these |
| Q.21) | If A and B are any two fuzzy sets then A∩B | | | C |
| A) Max {A(x), B(x)} | | B) 1- membership grade function |
| C) Min{A(x), B(x) \} | | D) None of these |
| Q. 22) | The set {x / A(x) ≥ α} represent | | | D |
| A) Strong α-cut of fuzzy set A | | B) Fuzzy set A |
| C) Support of fuzzy set A | | D) α-cut of fuzzy set A |
| Q. 23) | Height of the fuzzy set is | | | C |
| A) 0.9 | | B)0.1 |
| C) 0.91 | | D) 1 |
| Q. 24) | The degree of subset hood  is defined as | | | B |
| A) | | B) |
| C) | | D) |
| Q. 25) | In fuzzy set A, the compliment of fuzzy set A is defined as | | | A |
| A) | | B) |
| C) | | D) |

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**(An Autonomous Institute)**

**S. Y. B. Tech. (Semester-III)**

**END SEMESTER EXAMINATION, January 2022**

**COURSE NAME:** Liner Algebra, **COURSE CODE:** 201AIMLL201

Seat No :

**Day and Date: Saturday, 05.02.2022**

**Time: 11.00 am to 12.30 pm Max. Marks- 50**

***Instructions:***

1. *All Questions are* ***compulsory.***
2. *Figure to the right indicate* ***full marks****.*
3. Use of **non-programmable** calculator is allowed.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **BT** | **CO’s** | | **Q. No.** | | | **Statement of Question** | **Marks** |
|  |  | | **Q.1** | | | **Attempt the following** | **20** |
| **L3** | **201.1** | | **a** | | | Let be the set of all positive reals. Define addition of any two members x and y to be the usual multiplication of numbers that is , define scalar multiplication by a scalar k to any member is to be . Show that V is a vector space. | **7** |
| **L3** | **201.2** | | **b** | | | Calculate the rank and nullity of the matrix | **7** |
| **L3** | **201.3** | | **c** | | | Let F be a function defined by the formula    Show that F is a linear transformation. | **6** |
|  | | | | | | | |
|  | |  | | **Q.2** | **Attempt the following** | | **15** |
| **L3** | | **201.4** | | **a** | Using Euclidean inner product on . Show that  Satisfy Cauchy-Schwarz inequality. | | **7** |
| **L3** | | **201.5** | | **b** | Consider the fuzzy sets A and B given by Calculate  **OR**  Calculate for where | | **8** |
|  | | | | | | | |
|  | |  | | **Q.3** | **Attempt the following** | | **15** |
| **L3** | | **201.6** | | **a** | Define fuzzy cardinality of fuzzy set and calculate the fuzzy cardinality of the fuzzy set defined by    **OR**  Determine which of the following fuzzy sets are fuzzy numbers | | **7** |
| **L3** | | **201.6** | | **b** | For the fuzzy set A and B defined on the Universal set X as    Calculate fuzzy set. | | **8** |

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