FY BSc SEM II MATHS PAPER II SAMPLE QUESTIONS

Q Choose correct alternative in each of the following

1. Which of the following is not a solution to the system 6□+4□=0

   (a) (−2, 3)

   (b) (6, −4)

   (c) (4, −6)

   (d) (2, −3)

2. Which of the following sets is Linearly Independent?

   (a) {(7, 5), (14, 10)}

   (b) {(7, 5), (5, 7)}

   (c) {(7, 5), (352,252)}

   (d) {(7, 5), (5, 7), (12, 12)}

3. The Nullity of the Linear transformation □:ℝ2→ℝ2 defined as (□, □) = (0, 0) is

   (a)0

   (b)1

   (c)2

   (d)3

4. If for a Linear transformation □:ℝ4→ ℝ3 the Rank of T=3 then the

   Dim (Ker (T)) =?

   (a) 2

   (b) 3

   (c) 1

   (d) 0

5. For which value of k does the following system have infinitely many solutions?

$2□-□=□4□-2□=6$

(a) 3

(b) 6

(c) 1

(d) 2

6. Which of the following set is a generating set of 3?

(a){(1, 2, 0), (0, 1, 1),(-1, 0, 1)}

(b){(1, 2, 1), (2, 4, 2), (-1, 0, 1)}

(c){(1, 1, 0), (0, 1, 1)}

(d){(-1, 0, 1), (0, 1, 1), (0, 0, 0)}

7. If for a linear transformation Rank T = 4 then the nullity of T is

(a) 3

(b) 5

(c) 0

(d) None of these

8. Which of the following is not a solution to the system $5□-□=0$?

(a) (1, 5)

(b) (-1,-5)

(c) (-2, -10)

(d) (-1, 5)

9. Which of the following sets is linear dependent?

(a) {(1, 1), (-1, 1)}

(b) {(1, 2), (2,1)}

(c) {(3,34),(0,3)}

(d) {(3,3), (2,2)}

10. If for a linear transformation □:ℝ4→ ℝ3 the Dim(Img(T)) = 2 then the nullity of T is

(a) 2

(b) 4

(c) 1

(d) 3

11. A system of linear equation is inconsistent, if it

(a) is solvable

(b) is not solvable

(c) has unique solution

(d) has infinite solution

12. Homogenous system of linear equations always has

(a) no solution

(b) a trivial solution

(c) a non trivial solution

(d) infinite solution

13. System of m linear equation in n variables, having r as the number of its pivot elements, Which one of the following possibilities is never true?

(a) $r \leq m$

(b) $r < n$

(c) $r = n$

(d) $r > n$

14. System mentioned above is consistent, then it has infinite solution, if

(a) $r < n$

(b) $r = n$

(c) $c > n$

(d) none of the above

15. A system of linear equations given by

$$\begin{bmatrix} 1 & 2 \\ 0 & 3 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 3 \end{bmatrix}$$

(a) is consistent

(b) is inconsistent

(C) has zero solution

(d) has many solution

16. A Singlton set { 0 } can never be a vector space under any operations, because

(a) it is finite set

(b) it has nothing worth in it

(c) one cant have + and • on zero

(d) this is a false statement

17. The set of all irrational numbers under the usual + and • , is not a vector space over $\mathbb{R}$ because

(a) it is not closed under +

(b) it is not close number •

(c) it does not have zero

(d) All of the above

18. The singleton set { 0 } of any vector space V is

(a) Linearly independent

(b) Linearly dependent

(c) Neither linearly dependent nor independent

(d) Depends on the vector space V

19. The empty set ϕ of any vector space V is

(a) Linearly independent

(b) Empty means nothing, nothing means zero, $\therefore$ linearly dependent

(c) Neither dependent not independent

(d) Depends on the nature of the vector space V

20. V is a vector space over $\mathbb{R}$. S is linearly independent set of vector from V. Then

(a) Every subset of V, is linearly independent

(b) Every subset of V, is linearly dependent

(c) Every subset of S, is linearly independent

(d) Every subset of S, is linearly dependent

21. V is a vector space over $\mathbb{R}$. S is linearly dependent set of vector from V. Then

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(d) Every subset of S, is linearly dependent

22. A linear transformation is basically

(a) A linear equation

(b) A system of linear equation

(c) A line in geometry

(d) A mapping between two vector spaces

23. $T : \mathbb{R}^2 + \mathbb{R}^3$, defined as $T(x , y) = (1 , 2 , 3), \forall\ (x , y) \in \mathbb{R}^2$ is not a linear transformation because

(a) T is not defined properly

(b) T is not function

(c) $(0 , 0)$ of $\mathbb{R}^2 \not\rightarrow (0 , 0 , 0)$ of $\mathbb{R}^3$

(d) where does $(1 , 2 , 3)$ come from?

24. V and V` are two vector spaces with their respective zero as 0 and 0`.

$T : V \rightarrow V`$ is a linear transformation , given by $T(u) = 0` , \forall\ u \in V$. Then

(a) Ker T = { 0 } , Im T = { 0` }

(b) Ker T = { 0 } , Im T = V`

(c) Ker T = V , Im T = { 0` }

(d) Ker V , Im T = V`

25. V is a vector space and T : V $\longrightarrow$ V is a linear transformation given by T (u) = u , $\forall$ u $\in$ V. Then ,

(a) Ker T = { 0 } , Im T = { 0 }

(b) Ker T = { 0 } , Im T = V

(c) Ker T = V , Im T = { 0 }

(d) Ker V , Im T = V