

RAN-2503000505023001
T.Y.B.Sc. Mathematics (Sem. - V) Examination October - 2025
Ancient Indian Mathematics And Linear Algebra (Major - 502)
Time: 1 Hour]
[Total Marks: 25

સૂચના : / Instructions (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fill up strictly the above details on your answer book (2) All questions are compulsory. (3) Figures to the right indicate marks of the questions. (4) Follow usual notations.	Seat No.: Student's Signature
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- Q. 1 Answer the following questions (Any Five):** **(5)**
1. Describe the contribution of Madhava of Sangamagrama in brief.
 2. Find square root of a number 144 by using Āryabhata Algorithm.
 3. Obtain the value of $\sqrt{2}$ by using Sulba - sutra formula.
 4. Let S be a non empty subset of a vector space V then prove that $[[S]] = [S]$.
 5. In a vector space V , prove that $0 \cdot u = 0, \forall u \in V$.
 6. If $A = \{(3, 2), (2, 3), (-2, -1)\}$ and $B = \{(-1, 3), (-3, -4)\}$ then find $A + B$.
- Q. 2. Answer the following (Any two):** **(10)**
1. Find square of a number 614 by using Āryabhata Algorithm.
 2. Find integer square root of a imperfect square number 35241 by using Āryabhata Algorithm.
 3. What is the Bakshali method for approximating the square root of a non square number? Explain with a brief example.
- Q. 3. Answer the following (Any two):** **(10)**
1. Is the set $S = \{(x_1, x_2, x_3) \in V_3 / x_1 = 3x_2 \text{ and } x_3 = 4x_2\}$ be subspace of a vector space V_3 ? Justify your answer.
 2. Determine which of the following vector belongs to the span of a set $S = \{(1, 2, 1), (1, 1, -1), (4, 5, -2)\}$. (a) $(2, -1, -8)$ (b) $\left(\frac{-1}{3}, \frac{-1}{3}, \frac{1}{3}\right)$
 3. Let $S = \{u_1, u_2, u_3, u_4, \dots, u_{10}\}$ be any non empty subset of a vector space V then prove that $\{\alpha_1 u_1 + \alpha_2 u_2 + \alpha_3 u_3 + \alpha_4 u_4 + \dots + \alpha_{10} u_{10} / \alpha_i \in \mathbb{R}, u_i \in S, \forall i = 1 \text{ to } n\}$ is a subspace of V .