

**RAN-2503000505023001**
**T. Y. B. Sc. Mathematics (Sem.-V) Examination March - 2026**
**Major-502-Ancient Indian Mathematics And Linear Algebra**
**Time: 1 Hour ]**
**[ Total Marks: 25**

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| <b>સૂચના : / Instructions</b><br>(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.<br>Fill up strictly the above details on your answer book<br>(2) All questions are compulsory.<br>(3) Figures to the right indicate marks of the questions.<br>(4) Follow usual notations. | Seat No.:<br><input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/><br><div style="border: 1px solid black; height: 80px; margin-top: 10px;"></div> <div style="text-align: center; margin-top: 5px;">Student's Signature</div> |
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**Q.1 Answer the following questions (Any Five): 5**

- Which ancient mathematician founded the Kerala School of Mathematics?
- Find square of a number 21 by using  $\overline{\text{Aryabhata}}$  Algorithm.
- By using  $\overline{\text{Aryabhata}}$  Algorithm, find square root of a number 169.
- Let  $S$  be a non empty subset of a vector space  $V$  then prove that  $[[S]] = [S]$ .
- In a vector space  $V$ , prove that  $-u - v = -(u + v)$ ,  $\forall u, v \in V$ .
- If  $A = \{(1,2), (2,1), (-2, -1)\}$  and  $B = \{(1,3), (-3,5)\}$  then find  $A + B$ .

**Q.2 Answer the following (Any two): 10**

- Discuss  $\overline{\text{Aryabhata}}$  algorithm for finding the square root of a number as explained in Ancient Indian texts.
- Find square of a number 786 by using  $\overline{\text{Aryabhata}}$  Algorithm.
- Obtain the value of  $\sqrt{2}$  by using Sulba-Sutra formula. Calculate the approximate square root of 6423.

**Q.3 Answer the following (Any two): 10**

- Is the set  $S = \{(x_1, x_2, x_3) \in V_3 / x_1 - 2x_2 = x_3 - \frac{3}{2}x_2\}$  be subspace of a vector space  $V_3$ ? Justify your answer.
- Determine which of the following vector belongs to the span of a set  $S = \{(1,2,1), (1,1, -1), (4,5, -2)\}$ . (a)  $(1,1,0)$  (b)  $(2, -1, -8)$
- Let  $U$  and  $W$  be two subspaces of a vector space  $V$  then prove that  $U + W$  be a subspace of  $V$ .