

B.Sc. Semester - 6 (NEP-2020) Examination**March/April-2026****MATH: Indian Knowledge System and Evolution of Mathematics (Major-16)****Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1 Answer any TWO out of THREE. (10)
- (1) Explain the concepts of IKS and discuss its interdisciplinary nature with special reference to Mathematics.
 - (2) Discuss the Sulbasutras as primary sources of Indian geometry. Explain their objectives and major geometric principles.
 - (3) Explain how practical needs such as altar construction led to the development of geometric methods in ancient India.
- Que.2 Answer any TWO out of THREE. (10)
- (1) Write a short note on the hypotenuse theorem stated in the Sulbasutras.
 - (2) State and prove Brahmsphut-Sidhdant on cyclic quadrilateral.
 - (3) Write a short note on work of Aryabhata in Astronomy.
- Que.3 Answer any TWO out of THREE. (10)
- (1) What is the significance of decimal place value system in the development of Mathematics? How did Brahmagupta define and use zero in arithmetic operations?
 - (2) Define a Sutra in vedic mathematics. Write and explain any two arithmetic Sutras with an example of each.
 - (3) Prove: If $F(x, y) = Dx^2 - y^2$ and $h_0 = F(x_0, y_0)$ and $(x_1, y_1, h_1) = \left(\frac{m_0 x_0 + y_0}{h_0}, \frac{Dx_0 + m_0 y_0}{h_0}, \frac{D - m_0^2}{h_0} \right)$, then $Dx_1^2 - y_1^2 = -h_1$.
- Que.4 Answer any TWO out of THREE. (10)
- (1) Discuss the development of sophisticated concept of infinite and infinitesimal in Jain and Budhhist texts.
 - (2) Discuss the short summary of Kerala School of Mathematics development.
 - (3) Write down the concept of combinations and permutation discussed in the texts of Mahavira and Bhaskara-II and write down a single poetry.
- Que.5 Answer any TWO out of THREE. (10)
- (1) Give an overview of the Indian philosophical schools and explain why the Nyaya school was especially important for logic.
 - (2) Determine the smallest positive integer solution of $13x^2 + 1 = y^2$, if possible by Bhaskara's Chakravala method.
 - (3) Write a short note on "Construction of Sines" by Bhaskara II.
