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Vernier caliper experiment class 11 pdf

A vernier scale or clipper vernier is a measuring device used to measure linear dimensions accurately. It is a useful tool for measuring spherical and light objects. It has two main scales known as the main scale and scale of the vernier, which are divided into small divisions. Both scales have two perpendicular jaws in scale. The zeroes of the main scale and vernier scale overlap when the jaws are made to touch each other. The jaws and metallic bands are designed to measure the diameter of objects. In this experiment, we will learn to measure the diameter of a small spherical/cylindrical body using Vernier Clipper. Adjust the use of The Vernier Caliper to measure the diameter of a small spherical/cylindrical body. Equipment/materials required a spherical body such as a pendulum bob or a marble glass of a glass ware magnifying glass theory the smallest distance that can be measured over the distance is the smallest count. This is the difference between one central-scale division and one vernier-scale division. $\frac{1}{n} = \frac{M.S.D}{V.S.D}$ Formula used at least count of Vernier Calliper $\frac{1}{n} = \frac{\text{order of magnitude}}{\text{Smallest Division}}$ the Main Scale Diameter Revised = Observed Diameter Says – Error Diagram Zero Vernier Clipper Procedure keep the jaws of calliper vernier closed. Make sure that the zero of the primary scale is perfectly consistent with the zero of the vernier scale. To prevent a Parallax error, place the eye directly above the division mark. Release the moving jaw by releasing the screw gently. Slide it enough to hold the ball or the hilic body between the AB jaws without any undue pressure. Align the perfect perpendicular to the diameter of the body. Gently tighten the screw to tighten the device in this position to the body. Zero of the scale of the vernier against the zero of the main scale. Normally, it won't be completely overlapping with all divisions on the main scale. Riha vibrated the main scaling division to the left of the Epsy signs of the Vernier scale. Look for the exact coincidence of the Vernier scale division with that of the main scale division in the vernier window from the left on the right. Write down the number N. Multiply the N obtained by the least count of the device and add the product to read the main scaling that starts in step 4. Be sure to convert the product to appropriate units for a valid add-in. Repeat steps 3-6 to get the body postures in different positions on its curved surface. Be sure to take three sets of reading anyway. Record the observations in a tabular column with a correct read. Necessary Reset correction. Find the average account of corrected readings of the body's diameter. Observations at least count of Vernier Callipers Division Main Scale = 1 mm = 0.1 cm Number of Venier Division Scale N = 10 10 Division Scale Vernier = 9 Division Main Scale 1 Division Scale Vernier = 0.9 Scale Division Vernier Fixed = 1 Division Main Scale – 1 Division Scale vernier = (1 - 0.9) divisions main scale = 0.1 divisions on primary scale Fixed Vernier = 0.1 mm = 0.01 cm $\frac{1}{n} = \frac{\text{True Read} - \text{Observed Read} - (\pm \text{Zero Error})}{1}$ table for measuring the diameter of small body / S balls. Main Scale Read, M (cm/mm) Number overlapping vernier division, N Vernier read scale, V = N × VC (cm/mm) measured diameter, M + V (cm/mm) 1 2 3 4 $\frac{1}{n} = \frac{\text{Zero Error} - (\pm \text{cm})}{1}$ Average observed diameter = revised cm diameter = mean observed diameter – error result zero diameter of the ball / given cylinder is _____ cm. Viva Cole What is the principle of vernier? Answer: The vernier scale uses the alignment of line segments displaced by a small amount to make subtle measurements. How is clippers' least count calculated? Answer: The least count also known as vernier is the difference between one main-scale division (1 mm) and one vernier-scale division (0.9 mm). It can also be calculated by dividing the smallest unit on a primary scale by the total numbers on the vernier scale. Answer: The Vernier constant is the ratio of the smallest division of the main scale to the number of divisions of the vernier scale. What is a Paralex error and how can I avoid it? Answer: Parallax is an effect where the orientation and position of the object look different when they see you from different lines of sight. What are the precautions to take when using Verniers? Answer: Here are the precautions to take when using verniers: If the vernier scale does not slide smoothly on the main scale, apply oil to machine or machine oil. Keep an eye directly above the division mark to prevent a Paralex error. Knock the vernier firmly without unnecessary pressure to avoid damage to the screw's wires. What are the uses of Clippers and Raniere? Answer: The uses of vernier clippers are as follows: used in science labs used in steel industries used in aerospace industries used in steel industries to stay tuned with BYJU's to get the latest cbse announcement along with CBSE syllabus, sample papers, check kit and more. A vernier scale or clipper vernier is a measuring device used to measure linear dimensions accurately. It is a useful tool for measuring spherical and light objects. It has two main scales known as the main scale and scale of the vernier, which are divided into small divisions. Both scales have two perpendicular jaws in scale. The zeroes of the main scale and vernier scale overlap when the jaws are made to touch each other. The jaws and metallic bands are designed to measure the diameter of objects. 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