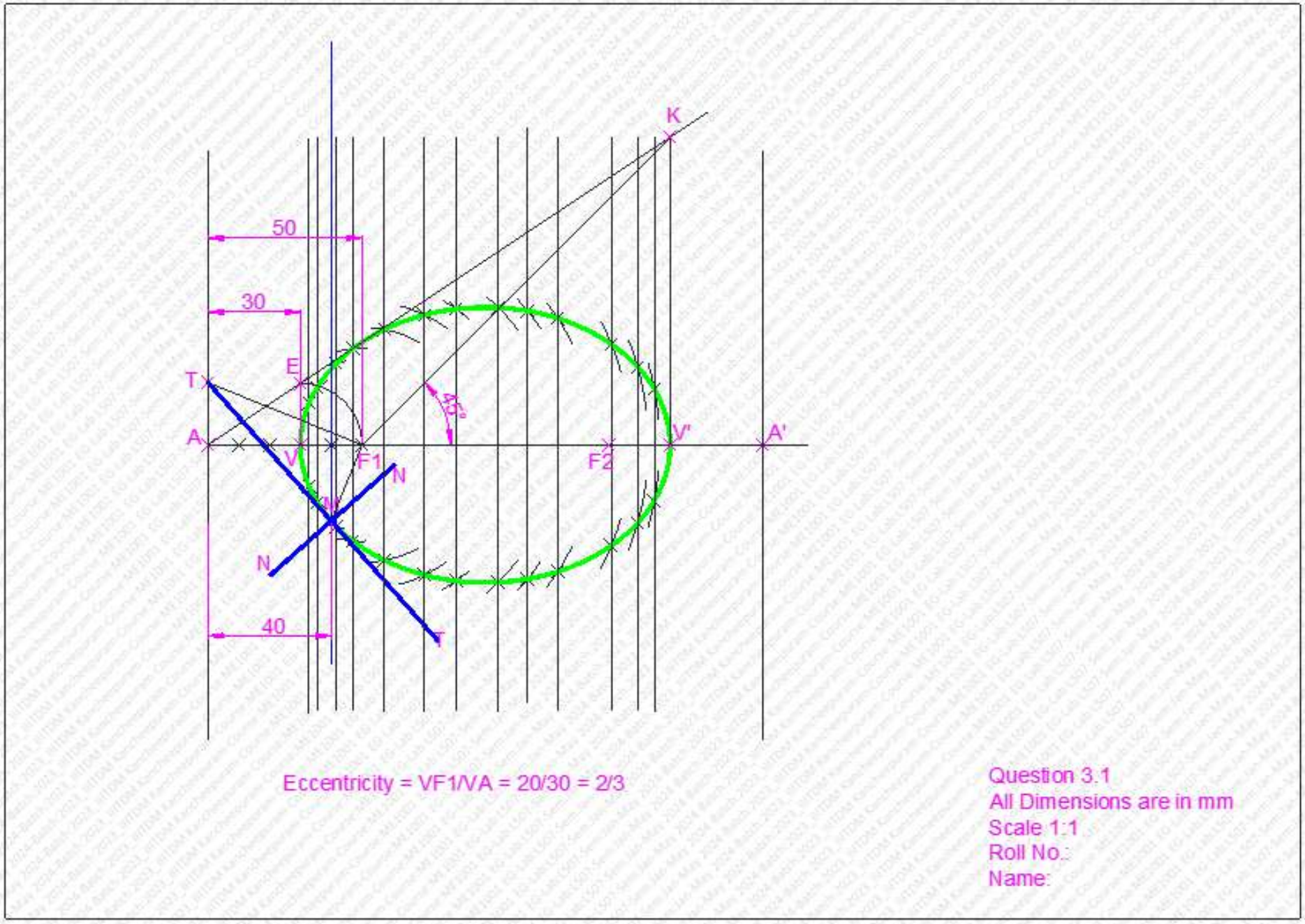
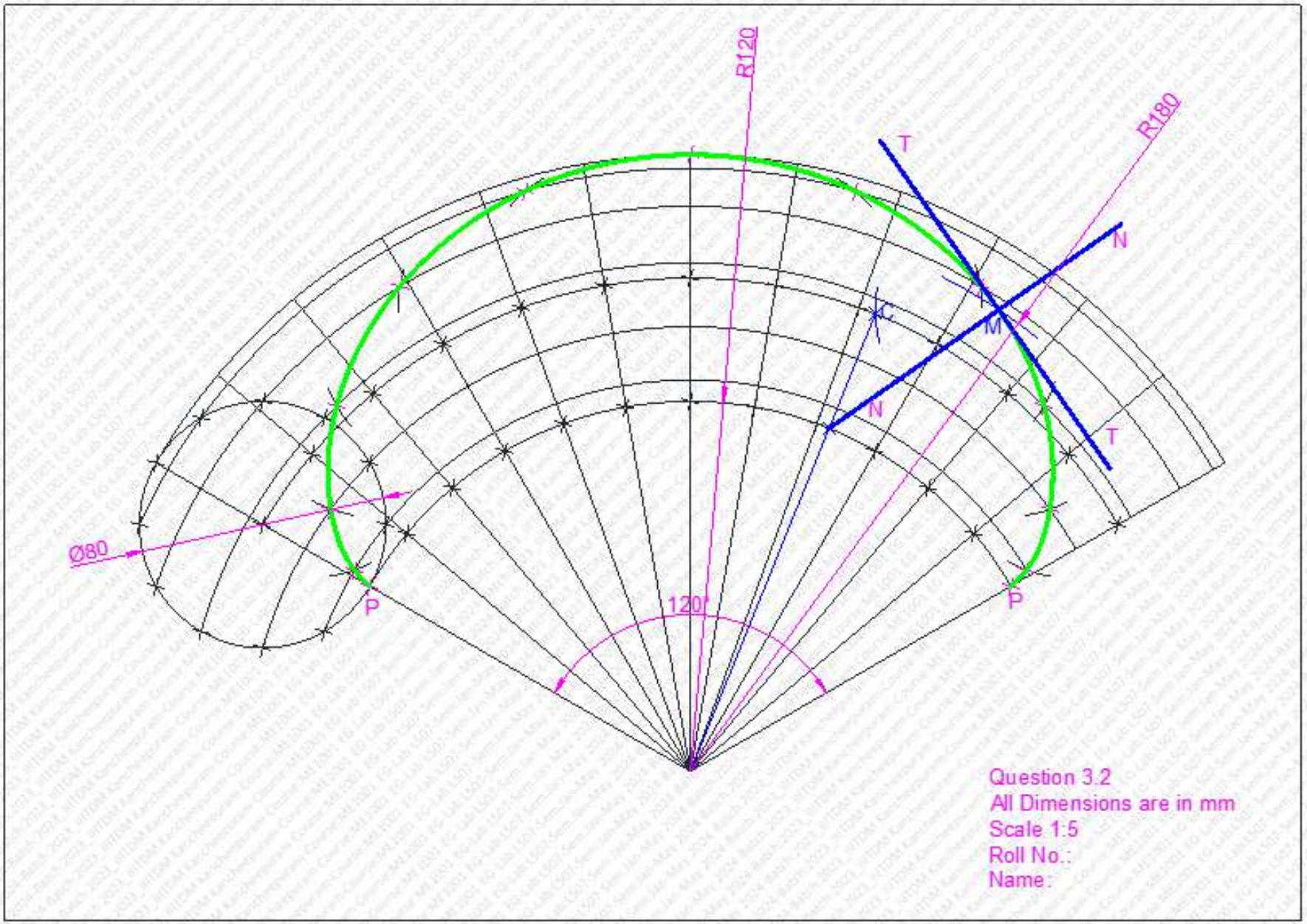
3.1. *Construct an ellipse, with distance of the focus from the directrix as 50 and the eccentricity is 2/3. Also, draw a tangent and normal to the curve at a point 40 from the directrix. (7 Marks)*

*Ref: Narayana. K.L, and Kannaiah. P, Engineering Drawing, Scitech Pub. Pvt. Ltd, 3rd Edition,* **Page No.: 108, Problem 2, Fig. 5.4.**



3.2. *Draw an epi-cycloid of a circle of 400 diameter, which rolls outside on another circle of 1200 diameter for one revolution clock-wise. Draw a tangent and a normal to it at a point 900 from the center of the direction circle. (10 Marks)*

*Ref: Narayana. K.L, and Kannaiah. P, Engineering Drawing, Scitech Pub. Pvt. Ltd, 3rd Edition,* **Page No.: 133, Problem 27, Fig. 5.35.**



3.3. *A disc in the form of a square of 35 mm side is surmounted by semi-circles on the two opposite sides. Draw the path of the end of the string, unwounded from the circumference of the disc. (8 Marks)*

*Ref: Narayana. K.L, and Kannaiah. P, Engineering Drawing, Scitech Pub. Pvt. Ltd, 3rd Edition,* **Page No.: 147, Problem 42, Fig. 5.51.**