



# UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 1 Examination in Engineering: December 2023 (Repeat)

Module Number: ME1201

Module Name: Engineering Drawing

[Three Hours]

[Answer **all** questions; each question carries **10** marks; all dimensions are in **millimetres**; **assume any dimensions not given**; use the given **A2 sheets** and you may draw **on both sides** of each sheet; page **margins** and the **title block** are required **only for Q1**; draw **Q1** on a **full page**. For other questions, you may draw answers to multiple questions on the same page, as space permits]

- Q1. With reference to the object shown in **Figure Q1**, using the **Third Angle** projection, and using an appropriate **scale**, draw the **Sectional Front View** in the direction of **arrow A**, by sectioning the object across a vertical sectioning plane which goes through the points **P**, **Q**, **R** and **S**. Also, add a geometrical tolerance and a dimensional tolerance, where appropriate.

[10.0 Marks]

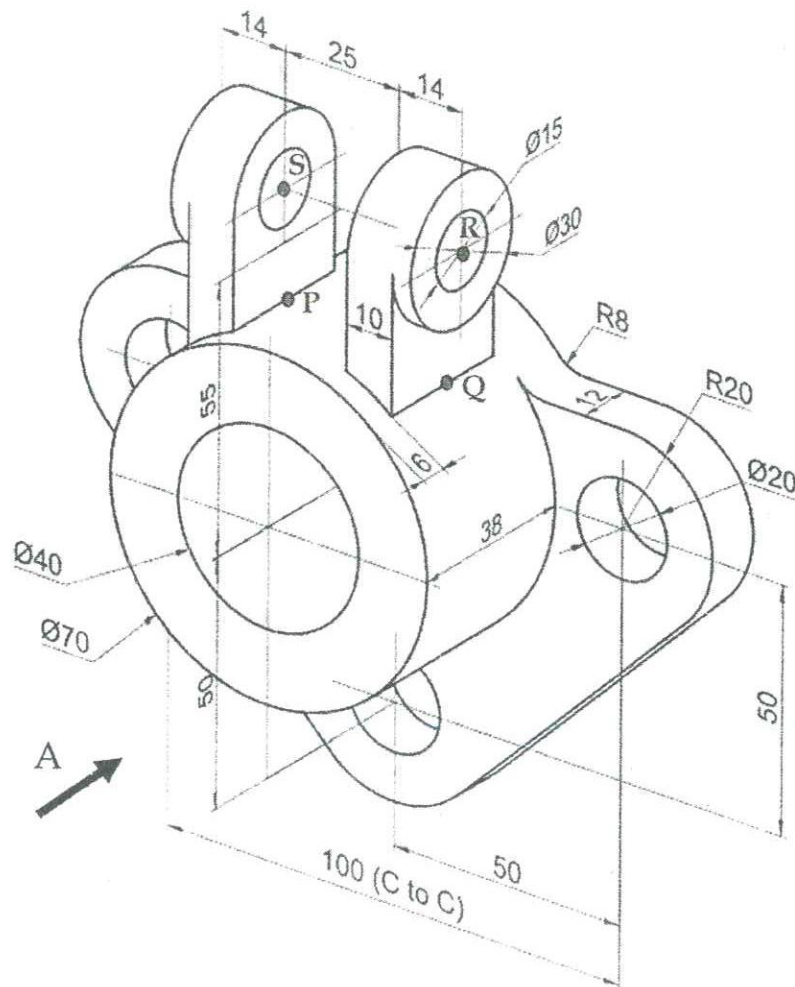


Figure Q1

Q2. Orthographic projections of an object drawn in the **Third Angle** projection are given in **Figure Q2**. Use the **isometric scale** and draw the **isometric view** of the object looking in the direction indicated by the arrows **A** and **B**.

[10.0 Marks]

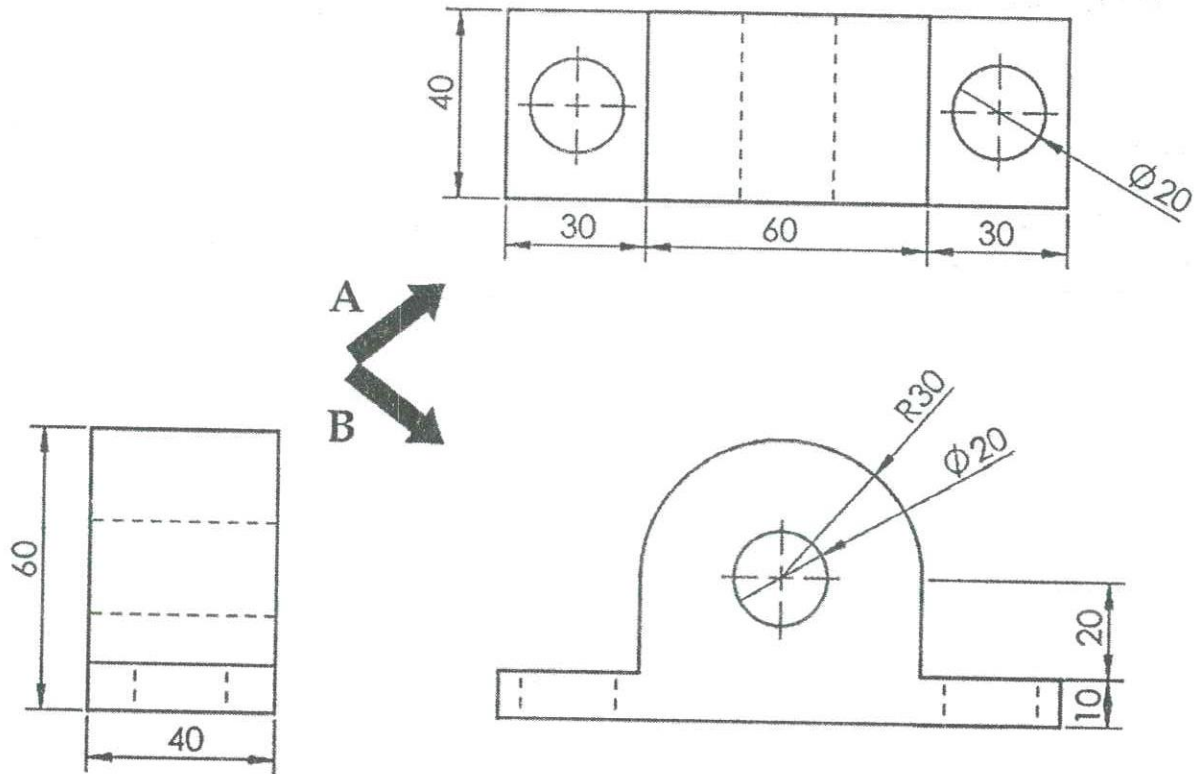


Figure Q2

Q3. A vertical cylinder of diameter 100 mm and height 100 mm is resting on the horizontal plane (**HP**). A horizontal cylinder of diameter 80 mm completely penetrates the vertical cylinder. The axis of the horizontal cylinder is parallel to both **HP** and vertical plane (**VP**), and passes 10 mm behind the axis of the vertical cylinder, 50 mm above the **HP**.

- Draw the **Plan** and **Front View** with the visible part of the intersection curve. [5.0 Marks]
- Draw the hidden parts of the intersection curve. [5.0 Marks]

- Q4. a) A 50 mm diameter disc rolls along a straight line, without slipping as shown in Figure Q4. Draw the locus of point *P* for half a revolution, if the point initially touched the straight line.

[4.0 Marks]

- b) After half a revolution rotation of the disc, it rotates but slips on the line through a 90° angle without moving forward where its axis remains at the same location during this period. After the slipping, the disc continues to roll again without slipping along the line for another half revolution. Continue to draw the locus of point *P* in Q4(a), for the slipped portion and the following half revolution without slipping. (Note: The total angular rotation of the disc is 450°.)

[6.0 Marks]

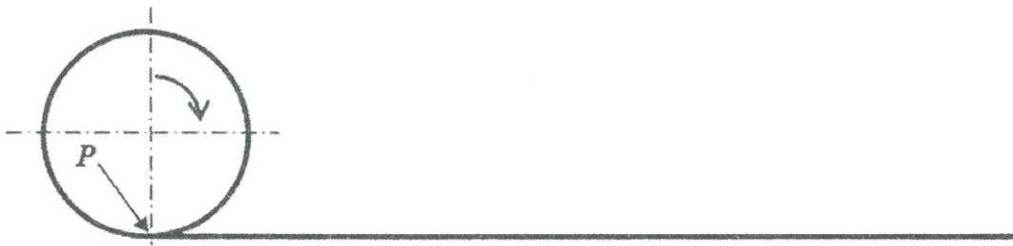


Figure Q4

- Q5. Figure Q5 shows the **incomplete Plan View** of a sheet metal transition piece required between a 40 mm square duct and an 80 mm X 60 mm rectangular duct. The height of the transition piece is 60 mm.

- a) Draw the **complete Plan view** and project the **Front View** in the direction of the arrow *X*. Name the rectangle as *abcd* and the square as *pqrs* in the plan view such that points *a* and *p* coincide in the plan view as given in Figure Q5.

[4.0 Marks]

- b) Draw the **complete development** of the transition piece. Take the seam along *CR*.

[6.0 Marks]

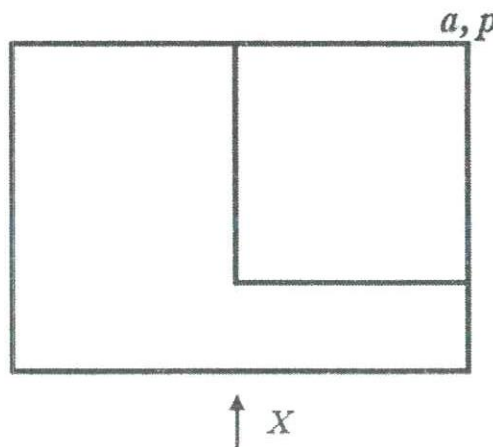


Figure Q5