39 + 1 (40)

ES 101: Engineering Graphics
Semester 1, 2024-25

Quiz 2

Date: 13th November 2024 **Time: 10:00 AM to 11:15 AM**

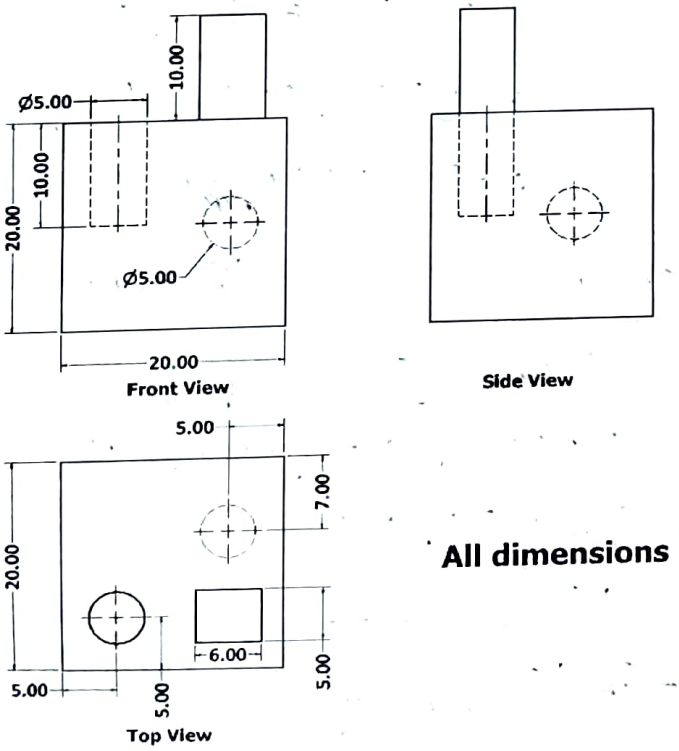
Name: AKSHIT CHHABRA

Roll Number: 24110026 **Group:** 3

Instructions

- Write name, roll number, and group number in the designated space. **Answer sheets with incomplete or no details will not be graded.**
- All drawings must be done with pencils. Pen must be used to answer all other questions.
- Mention scale in all drawings.
- No extra sheets will be provided.

Q 1. A component's top, front, and side views are given in the figure below. Since this part will be installed under the sea, all surfaces exposed to seawater will be coated with a thin anti-corrosion coating. If the cost of anti-corrosion coating is Rs. 7000/m^2, what will be the total cost incurred? *(5 points)*



All dimensions are in cm.

Solution: Given object is a cubical shape with a cuboidal entrusion and a cylindrical intrusion on the surface and a spherical cavity in the volume.

As the anti corrosion coating is to be applied to surfaces exposed to water, we need to find out the outer/external surface area.

Required surface area = Total surface area of cube + Curved surface area of cylinder + Lateral surface area of cuboid.

$$= 6s^2 + 2\pi rh + 2(l+b)H$$

$$= 6 \times 20^2 + 2 \times \pi \times \frac{5}{2} \times 10 + 2(6+5) \times 10$$

$$= 2400 + 157.079 + 220$$

$$= 2777.079 \text{ cm}^2$$

$$= 2777.079 \times 10^{-4} \text{ m}^2$$

Rate of anti corrosion coating = ₹ 7000 / m²

∴ Total Cost = Rate × Surface Area

$$= 7000 \times 2777.079 \times 10^{-4}$$

$$= 7 \times 277.7079$$

$$= 1943.9553$$

$$\approx ₹ 1943.96$$

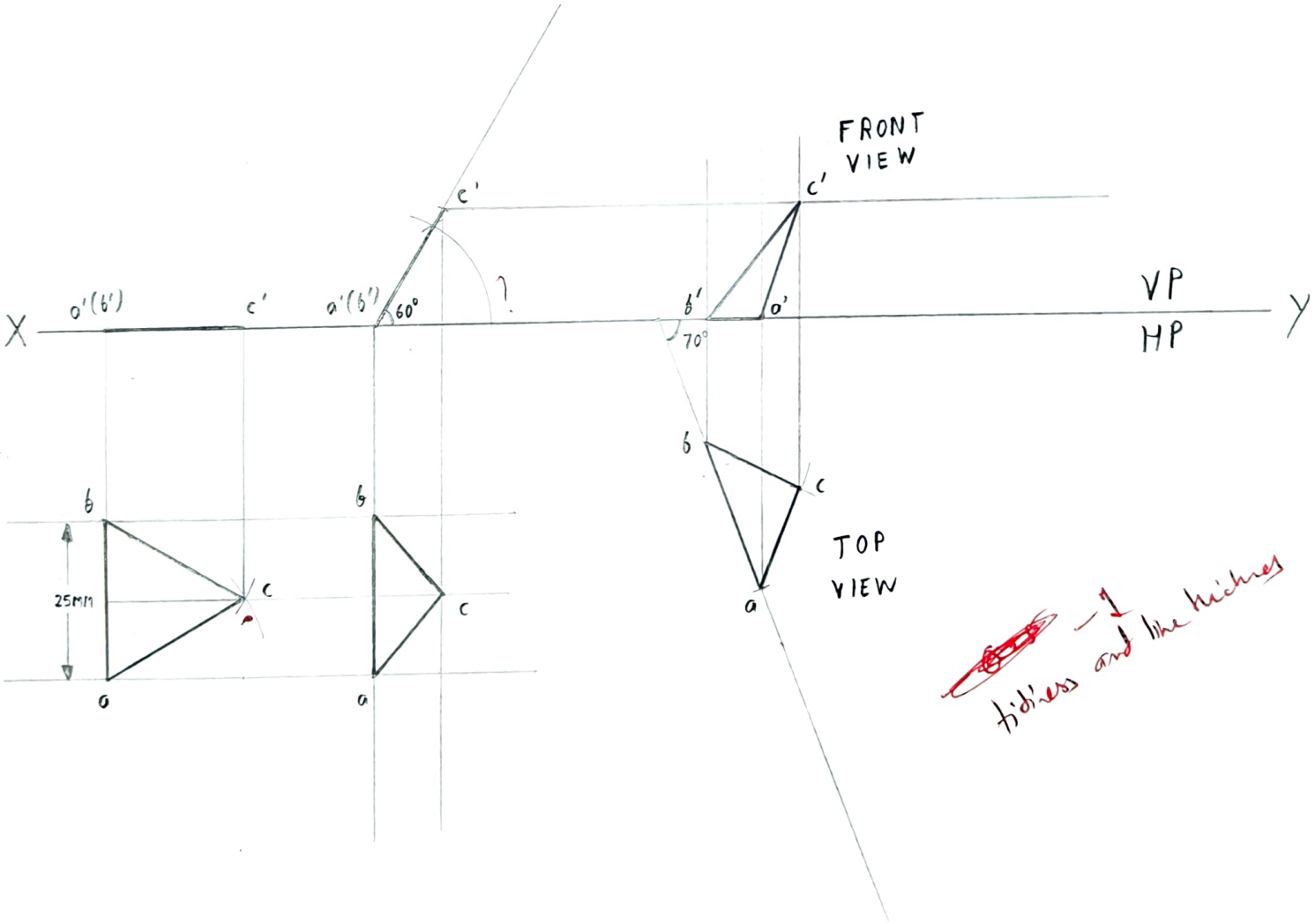
5

Q 2. An equilateral triangular ~~ar~~ of 25mm side lies with one of its edges on HP such that the surface is inclined to HP at 60°. The edge on which it rests on HP, is inclined to VP at 70°. Draw its front and top views. *(15 points)*

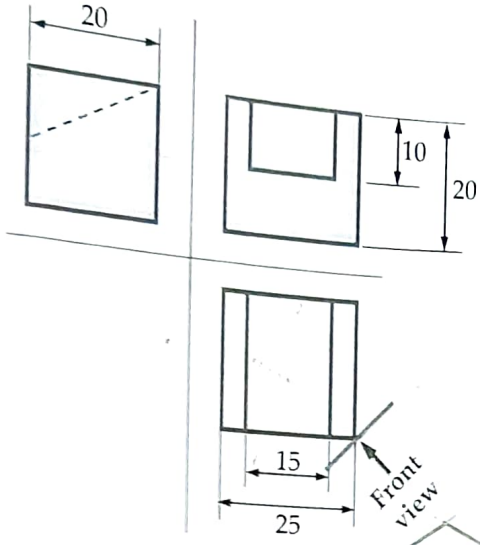
ALL DIMENSIONS ARE IN MM

SCALE = 1:1

14



-1
tidiness and line thickness



Q 3. Draw the isometric drawing of the following component. There is no need to dimension the sketch. *(12 points)*

SCALE = 1 : 0.25 ✓

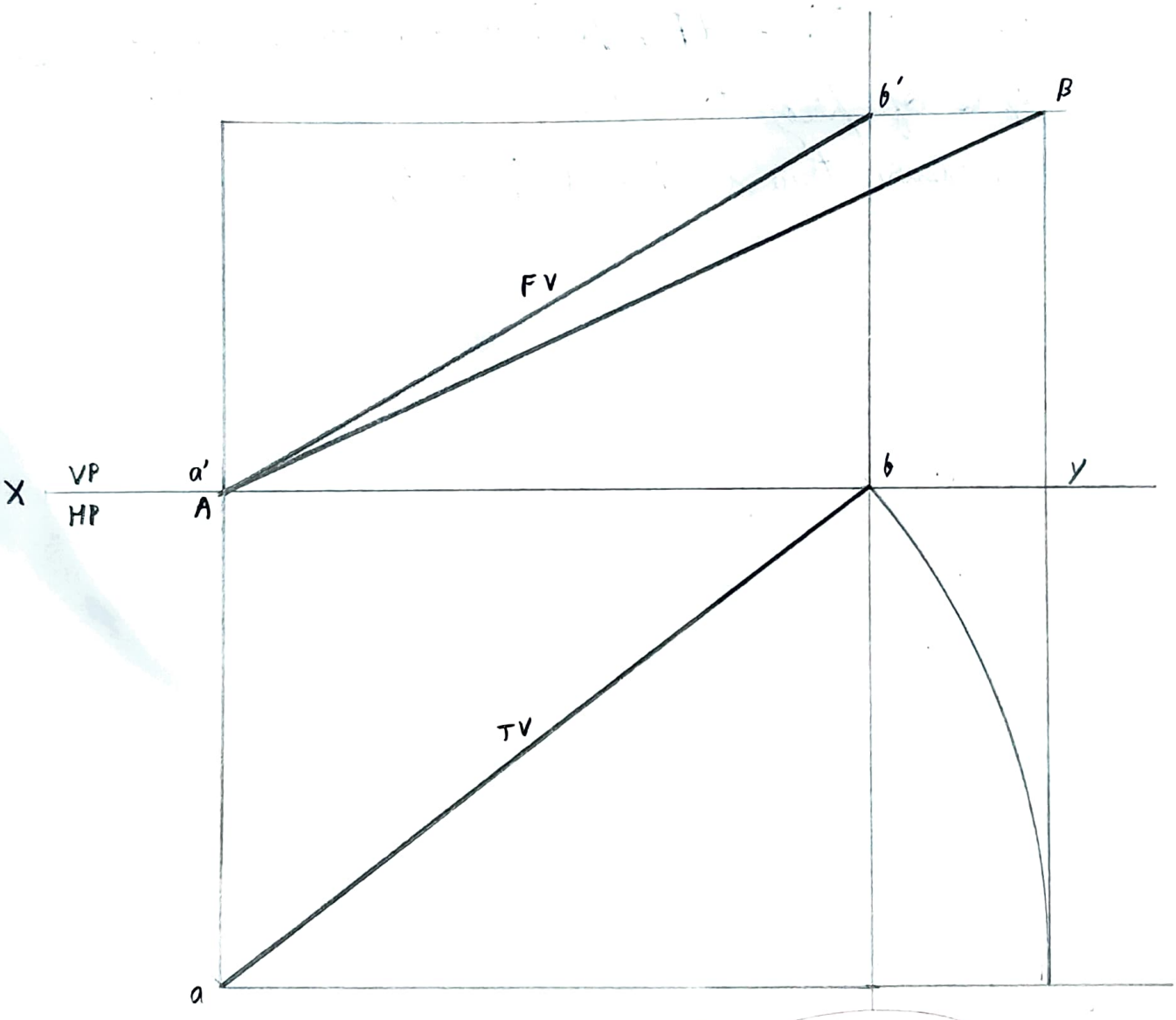
Improper drawing (check length) -3

9

30°

30°

Q4. A room is 5 m x 4 m x 3 m high. Determine graphically the distance between a top corner and the bottom corner diagonally opposite to it, i.e., the length of the body diagonal. Also, find the angle this body diagonal makes with the floor. Explain your approach in not more than four bullet points in the same area allocated for this question. *(13 points)*



SCALE = 1:50 -1

Measured Length = 14.1 cm

Accounting for scale, actual length = $14.1 \times \frac{50}{100}$ m

= 7.05 m ✓

Angle made with floor = 25° ✓

11 + 1 (-12)

The top view and front view of the main body diagonal of a cuboid are the four diagonals of the top and front face of the cuboid.

We can use the TV and FV to get the true length using the concepts of projection of line

We can measure true length and inclination