AM15/1.25s

L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

ADVANCED MATRICULATION LEVEL
2025 SECOND SESSION

Subject:	**Graphical Communication**
PAPER NUMBER:	I
DATE:	29th August 2025
TIME:	9:00 a.m. to 12:05 p.m.

Directions to Candidates

Write your index number where indicated at the top of all drawing sheets.

Attempt any **FIVE** questions.

Programmable calculators cannot be used.

Unless otherwise stated:

a. drawings should conform to B.S or equivalent (ISO) standards;
b. all dimensions are in millimetres;
c. all answers are to be accurately drawn with instruments;
d. all construction lines must be left in each solution;
e. drawing aids may be used.

Dimensions not given should be estimated.

Careful layout and presentation are important.

Marks will be awarded for accuracy, clarity and appropriateness of constructions.

Question 1.

Figure 1 shows an inclined rectangle, the centre lines of a truncated cone, and the cone base line. A parabola, which is the true shape of cut of the truncated cone, is to be constructed in the rectangle.

a. Copy the rectangle shown in Figure 1. (1)
b. Inside this rectangle construct a parabola placing the vertex as indicated. (5)
c. Find, by construction, the focus of the parabola. (2)
d. Find, by construction, the position of the directrix. (1)
e. Construct the truncated cone given that the diameter of the focal sphere is 60 mm. (7)
f. Project the plan. (4)

Note:
The diameter and the height of the truncated cone are to be determined by construction.

(Total: 20 marks)

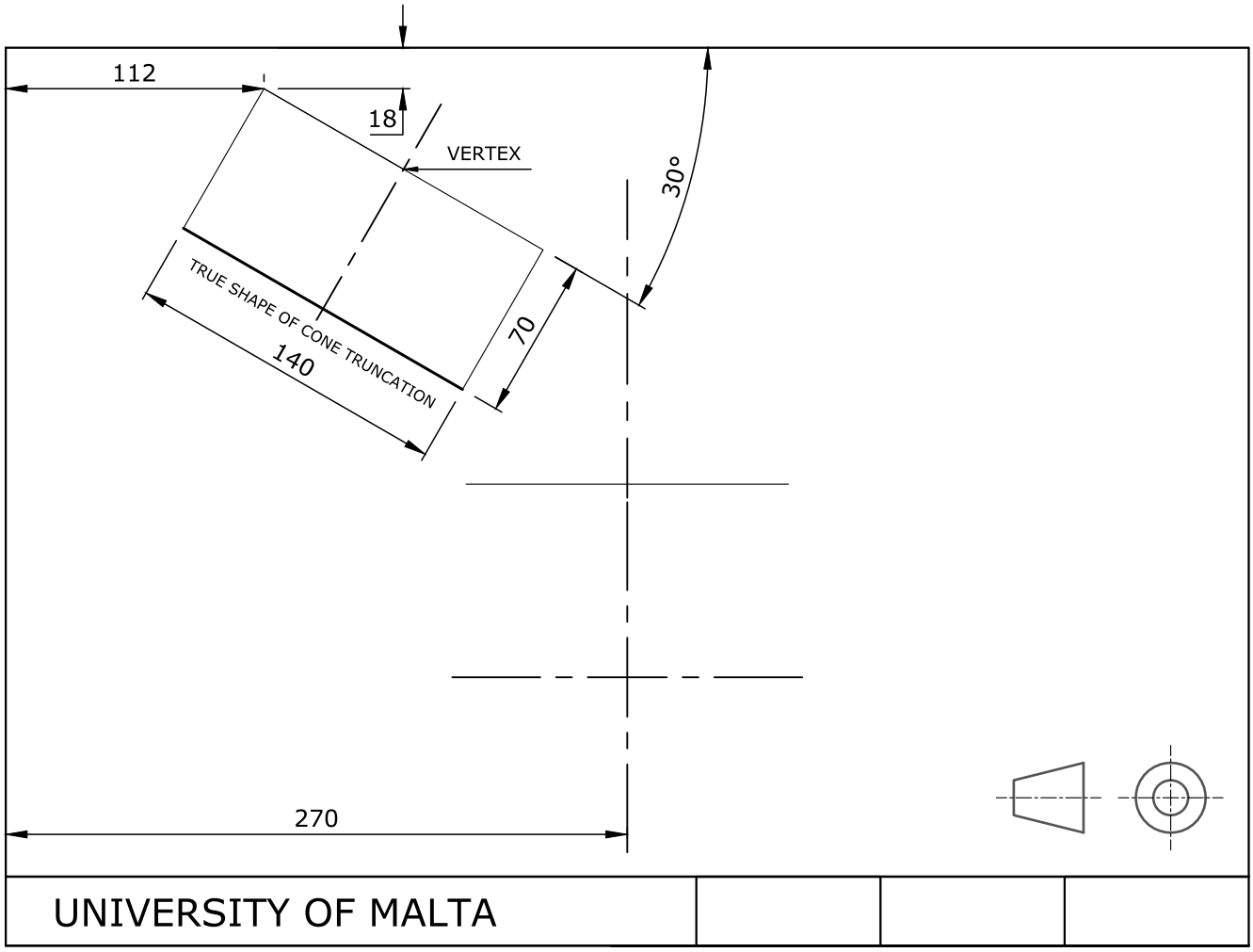


Figure 1

Question 2.

A pictorial view of a sheet metal full air flow tee 90° connector is shown in Figure 2a.
Dimensioned orthographic views of the connector (without the three short tubes attached to it) are also given in Figure 2b.

a. Copy the given views. (2)
b. Triangulate the front and end elevations. (3)
c. Construct the necessary true lengths. (4)
d. Construct a quarter surface development of the connector (shown shaded). (10)
e. Draw the symbols of symmetry. (1)

Note:
Place the joint line along a - 1.

(Total: 20 marks)

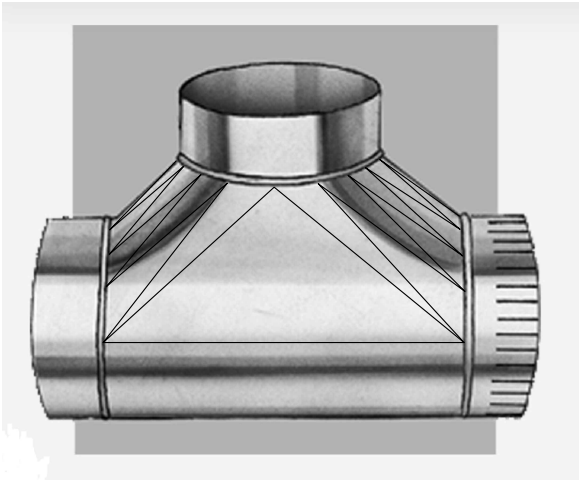


Figure 2a

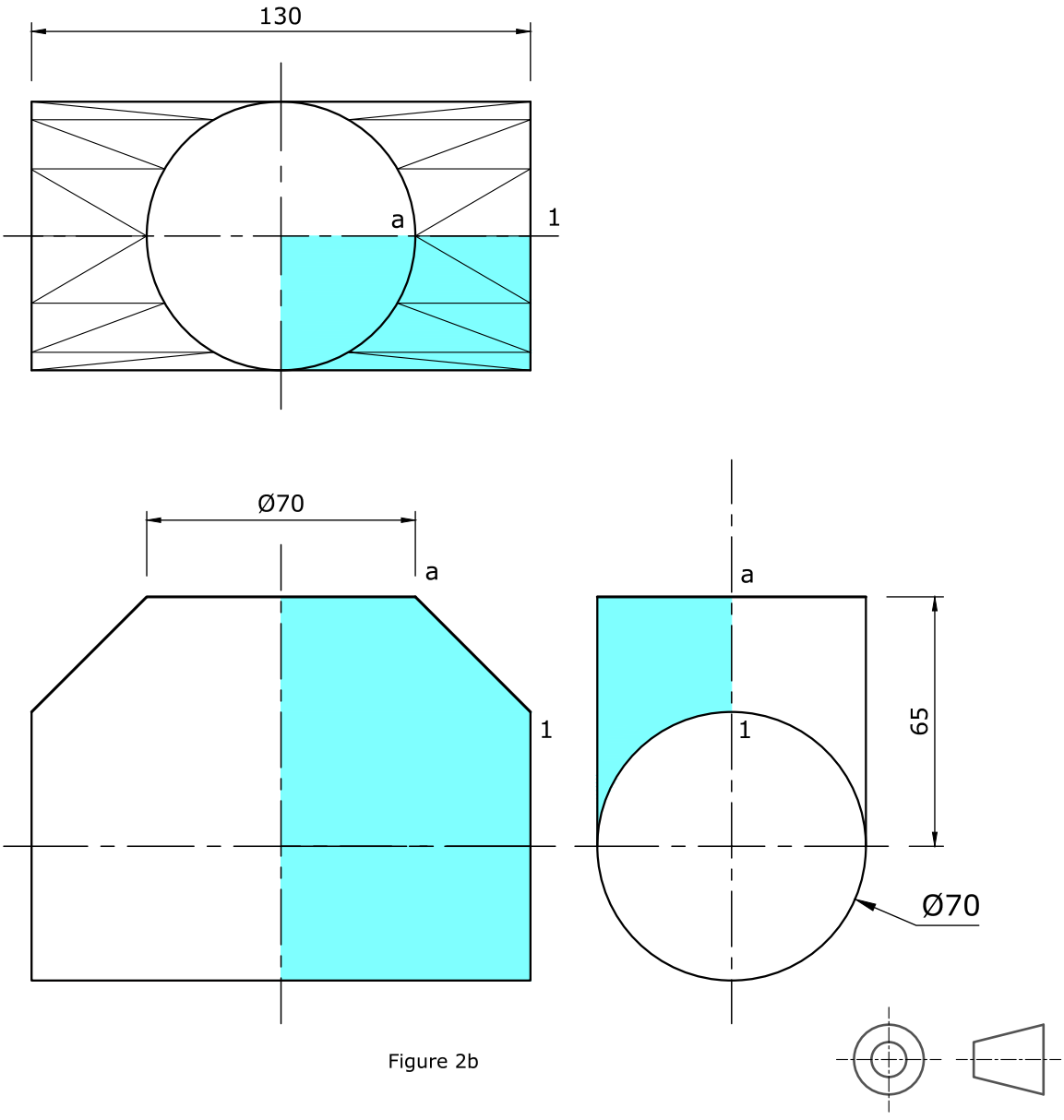


Figure 2b

Question 3.

Four othographic views of a small house with a partly oblique slanting roof (shown shaded) are given in Figure 3.

a. Copy the orthographic views. (3)
b. Project an auxiliary elevation from arrow 'B' to view the oblique roof as an edge view. (7)
c. Project a second auxiliary elevation of the house to determine the true shape of the oblique roof. (10)

Notes:
- The true width of the centrally located rear window is 28 mm.
- Do not show hidden detail.

(Total: 20 marks)

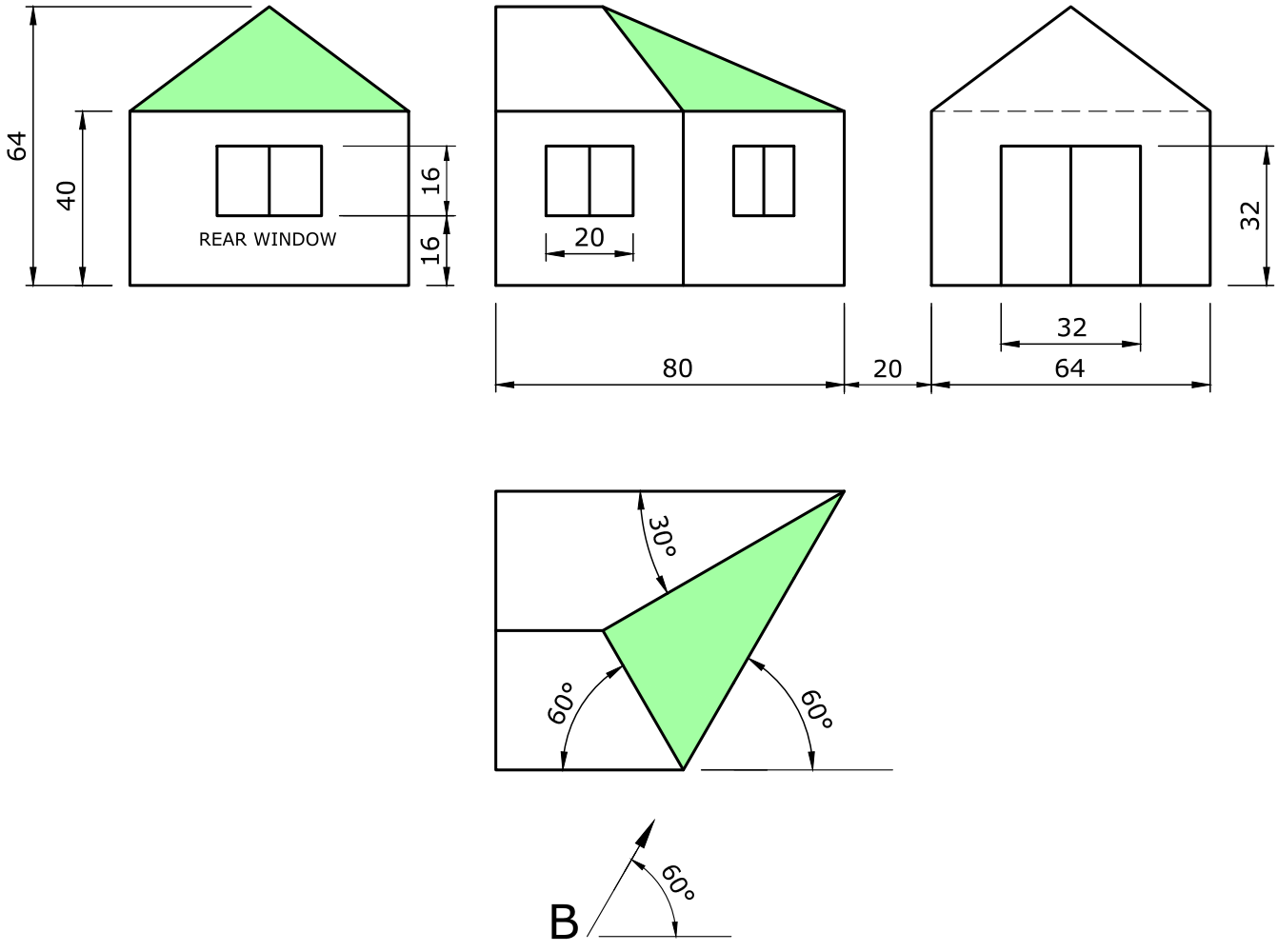
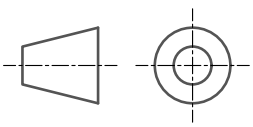


Figure 3



Question 4.

Figure 4a shows a pictorial view of a solid right square pyramid intersected by a square prism. After the intersection, the prism was removed leaving an indentation on the cone.
Figure 4b shows a complete auxiliary view of the indented pyramid, as seen from arrow 'A', and incomplete orthographic dimensioned views of the intersections.

a. Copy the given orthographic views and the auxiliary elevation. (3)
b. Project and draw the lines of intersection on the plan. (9)
c. Project and draw the lines of intersection to the front. (8)

Notes:
- All hidden lines are required.
- Label your drawing to avoid errors.

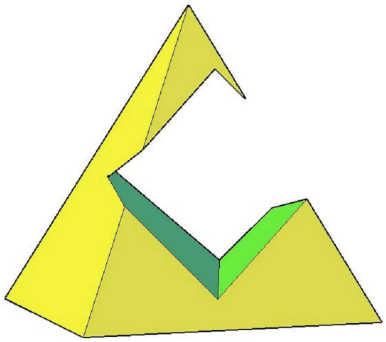


Figure 4a

(Total: 20 marks)

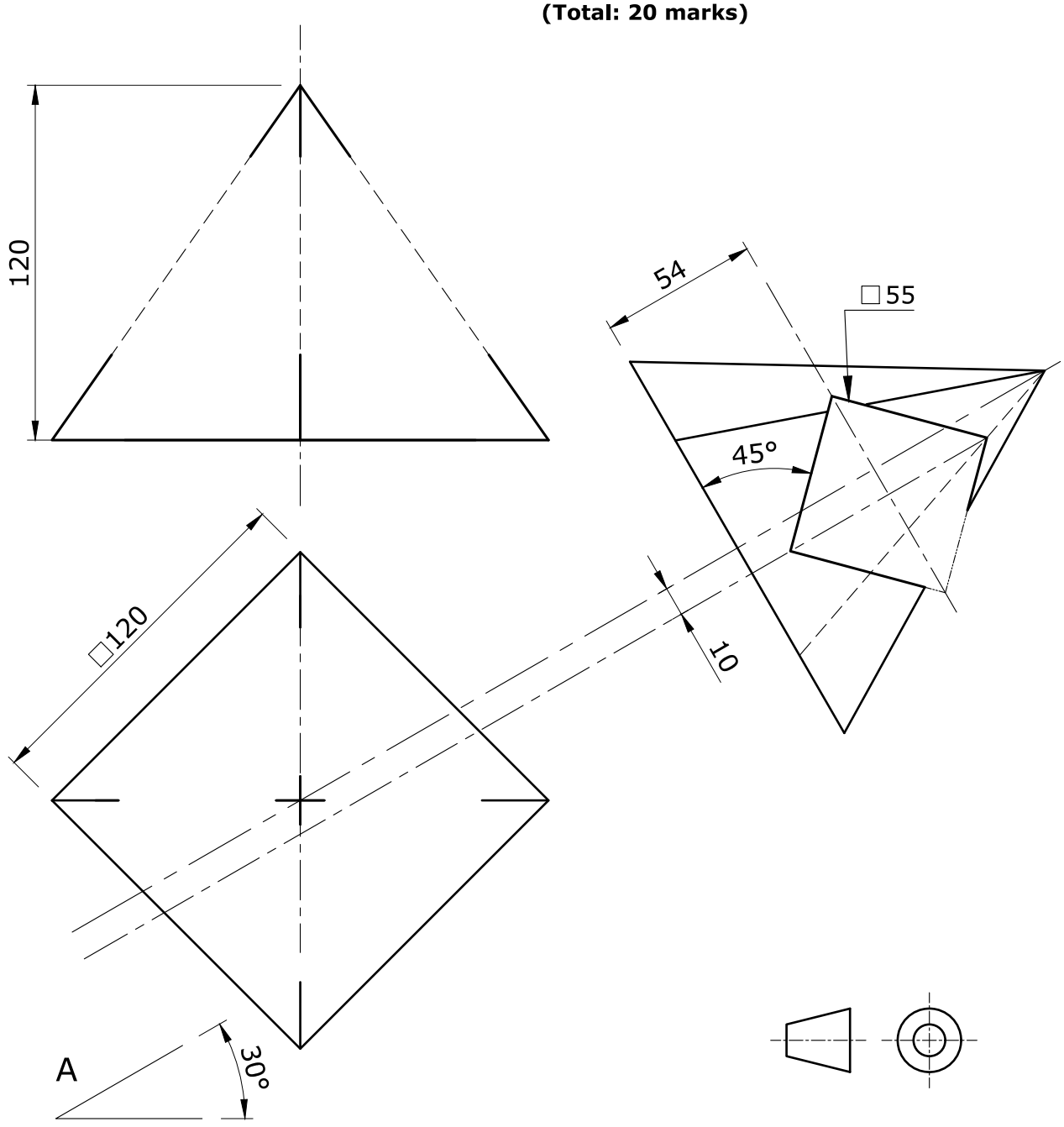


Figure 4b

Question 5.

The space diagram of a steel cantilever framework attached to a steady wall is shown in Figure 5.

a. Copy the space diagram using a scale of 20 mm representing 1 m. (1)
b. Apply Bow's notation. (1)
c. Draw the load line using a scale of 30 mm representing 10 kN. (1)
d. Draw the vector diagram. (6)
e. Determine graphically the reactions at the wall. (2)
f. Determine the forces in the members. (4)
g. State which members are in tension and which are in compression. (4)
h. Organise your results in a tabulated format. (1)

(Total: 20 marks)

SPACE DIAGRAM SCALE: 20 mm represents 1 m

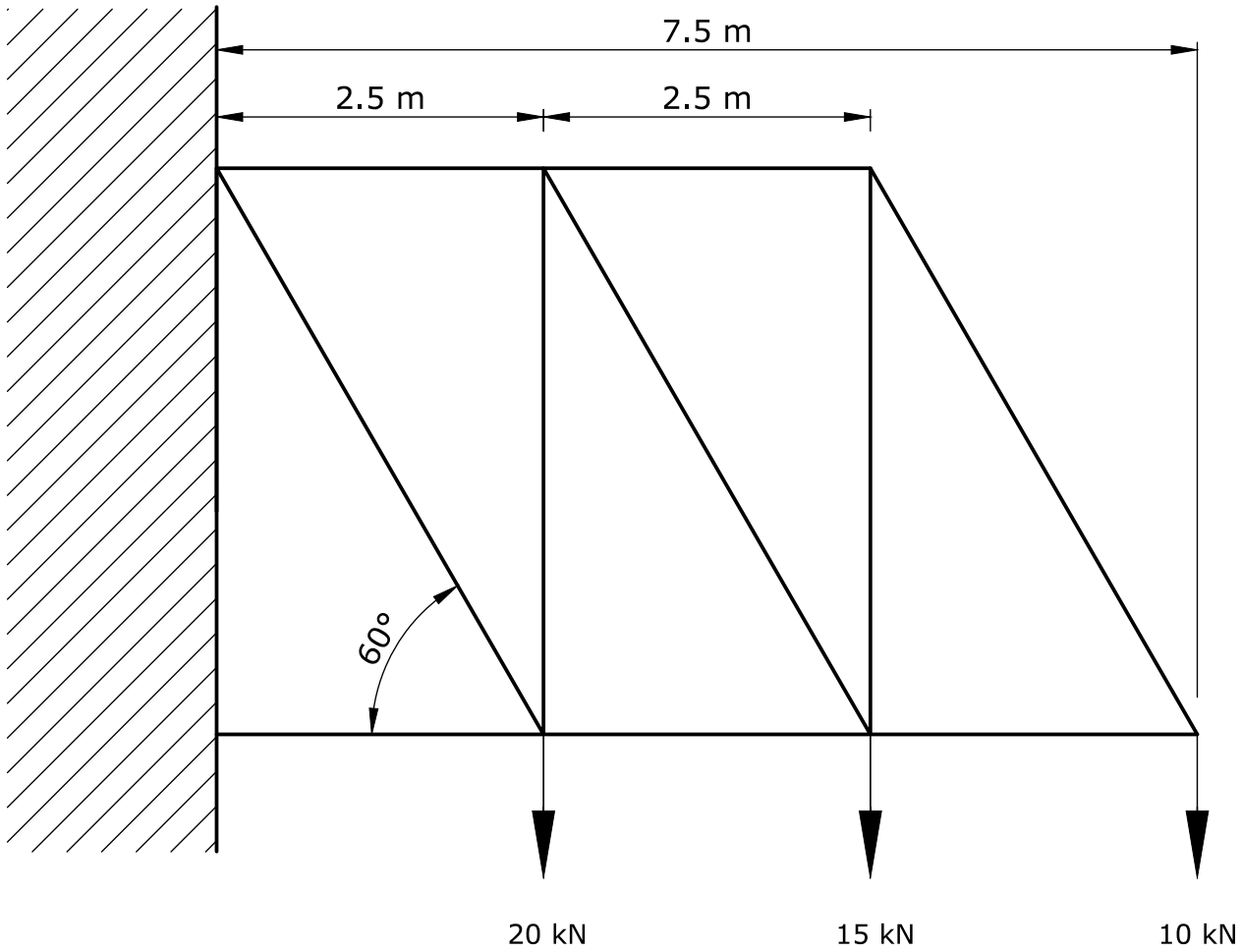


Figure 5

Question 6.

Three orthographic views of a machine component are shown in Figure 6.

a. Copy, full size, the three orthographic views without showing hidden detail. (7)
b. Construct a suitable isometric scale. (3)
c. Use the isometric scale to produce an isometric projection of the component. (10)

Notes:
- The curve of intersection in the end elevation is to be constructed.
- The layout of the solution is suggested in Figure 6.
- Do not dimension the drawing.

(Total: 20 marks)

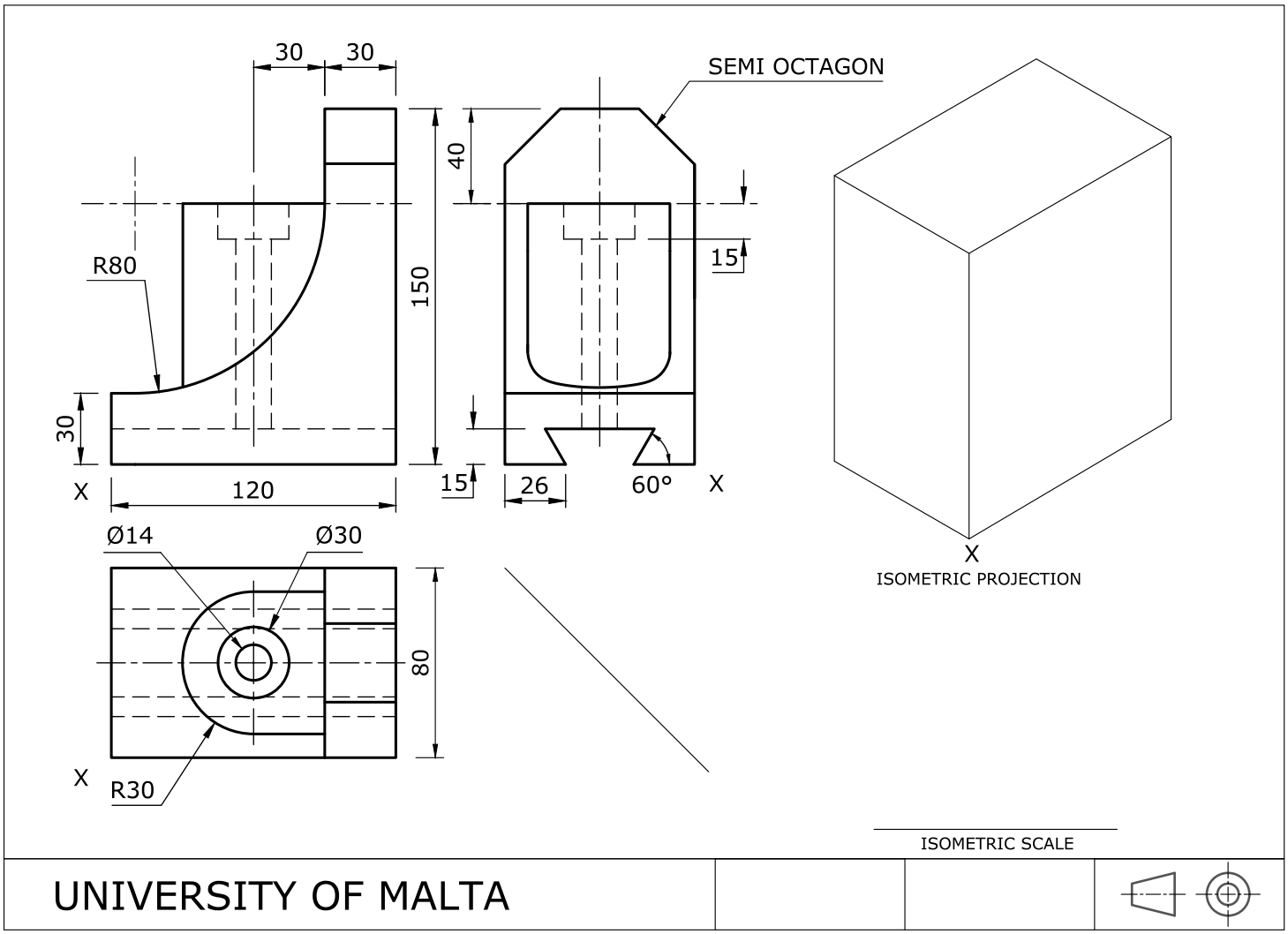


Figure 6

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EXAMINATIONS BOARD

ADVANCED MATRICULATION LEVEL
2025 SECOND SESSION

Subject:	**Graphical Communication**
PAPER NUMBER:	II
DATE:	1st September 2025
TIME:	9:00 a.m. to 12:05 p.m.

Directions to Candidates

Write your index number where indicated at the top of all drawing sheets.

Attempt any **FIVE** questions.

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d. all construction lines must be left in each solution;
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Careful layout and presentation are important.

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Question 1.

Figure 1 shows three orthographic views of a summer playground. The play area consists mainly of three castle like structures accessed by a short flight of steps, connected by bridges, and finally ending with a slide which leads to a small pool. The area is paved with rubber tiles.
These orthographic views below feature the proportion of every element within the entire setting. Use this information to construct a two-point estimated perspective of this setting. The arrows on the plan indicate the viewing direction.

a. Using **THREE** preliminary sketches, explore alternative positions of the horizon line and identify the one which, in your opinion, best describes the spaciousness of the entire area. These sketches should show the setting in question and executed with purpose. (3)

b. Based on the choice made in part (a), use a suitable scale to produce the required illustration on a single side of an A2 size paper, making the best use of the space available. (26)

c. Enhance your drawing by colouring small areas of the different items appearing in your illistration. (5)

(Total: 34 marks)

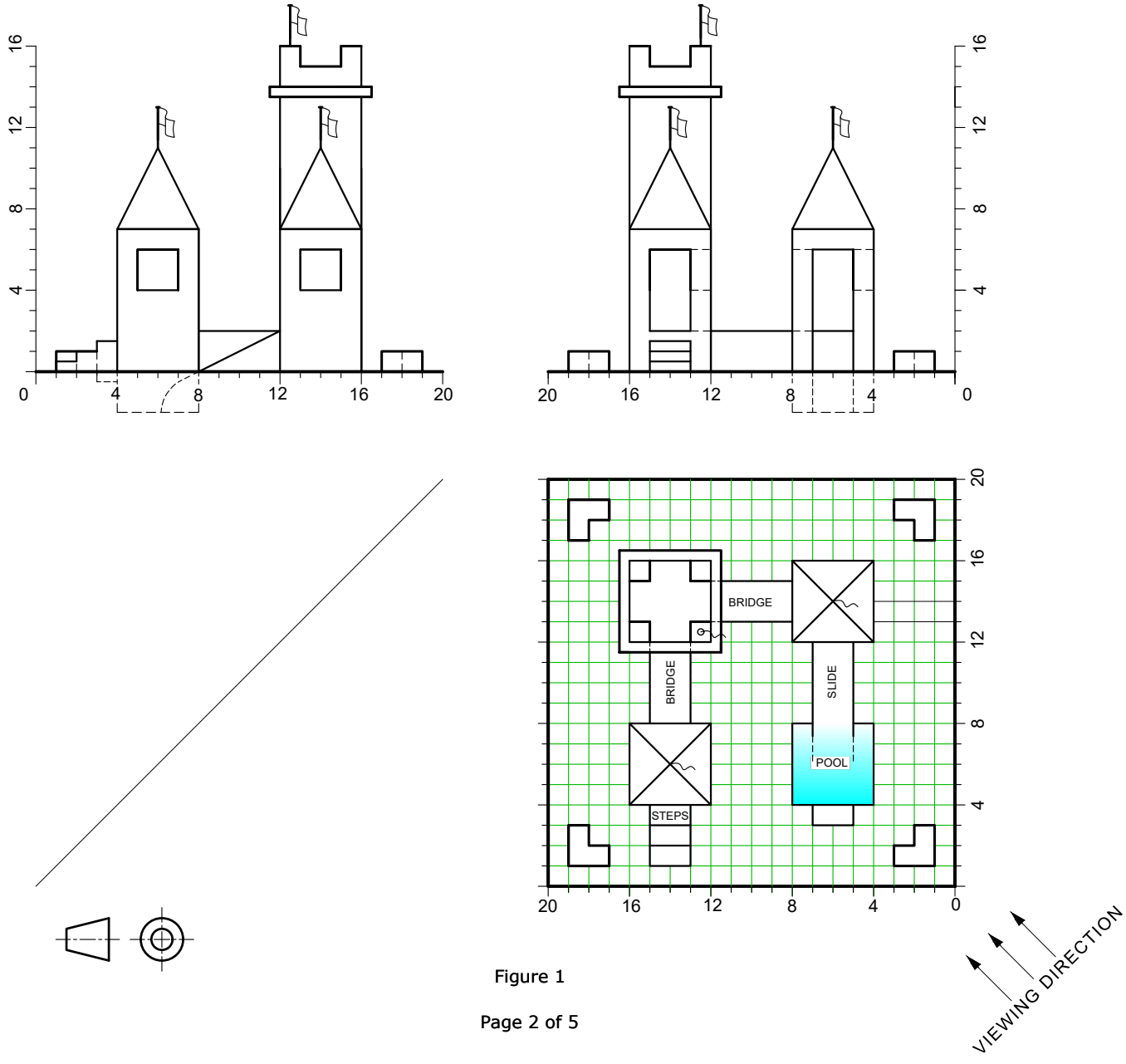

Figure 1

Question 2.

The management of an amusement park needs a set of pictograms for visitors to find their way round a number of attractions. The one for HAUNTED HOUSE has already been designed, as it appears in Figure 2. You are requested to design the remaining pictograms with the same style and format of the one shown by:

HAUNTED HOUSE

Figure 2a

a. drawing preliminary sketches in squares 50 X 50; (6)

b. drawing the final drawings in squares 100 X 100; (12)

c. rendering only **ONE** of the final drawings; (4)

The pictograms to be designed are the following:

i. Boat Ride
ii. Roller Coaster
iii. Shark Aquarium
iv. Fairy Garden
v. Star Dome
vi. Battle Arena

)

It is suggested to space your work as shown in Figure 3 below.

(Total: 22 marks)

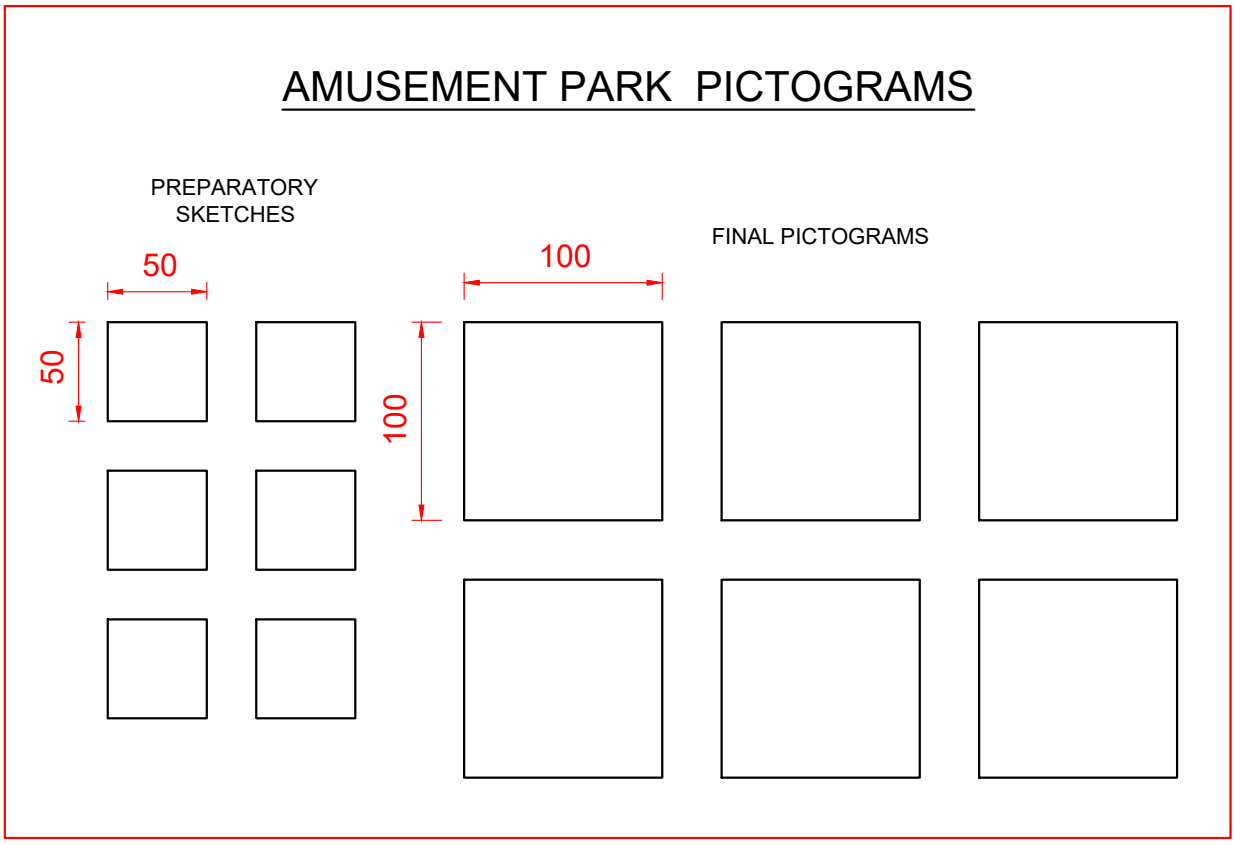

Figure 2b

Question 3.

Figure 3a shows an exploded pictorial view of a toy dinosaur. The company that manufactures these plastic toys needs to design an appealing packaging box to attract the attention of both the kids and their parents. The manufacturers' selling point is that this toy has the following benefits for the kids' development:

- improved problem-solving skills;
- improved motor skills (making precise movements using hands, fingers and wrists).

The manufacturers would also like to inform the customers that the toy conforms to safety Directive 2009/48/EC and that it is not suitable for children under 5 years.

You have been requested to design this box top which should include:

a. the title 'ASSEMBLE YOUR OWN DINO'; (1)
b. a colourful two-dimensional illustration of the assembled dinosour as seen from arrow 'F'; (5)
c. a graphic icon that illustrates problem solving skills; (5)
d. a graphic icon that illustrates motor skills; (5)
e. a prohibition sign to illustrate that this toy is **not** to be used by children under 5 years of age; (5)
f. a textual statement that the toy conforms to the above mentioned directive. (1)

Notes:

i. Figure 3b shows a vague suggested layout of your drawing sheet.
ii. Keywords, short phrases and initial thumbnail sketches are to be presented where indicated.
iii. Use suitable colours and typography.

(Total: 22 marks)

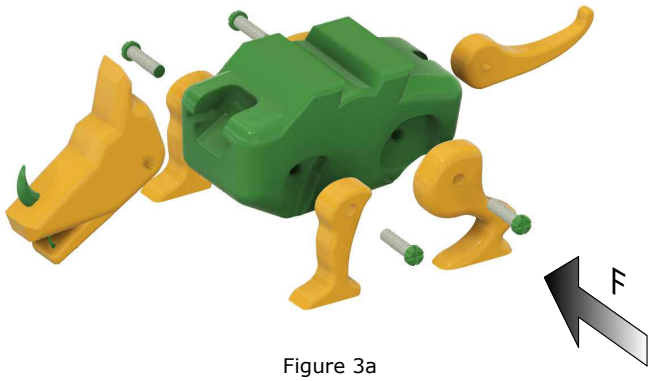

Figure 3a

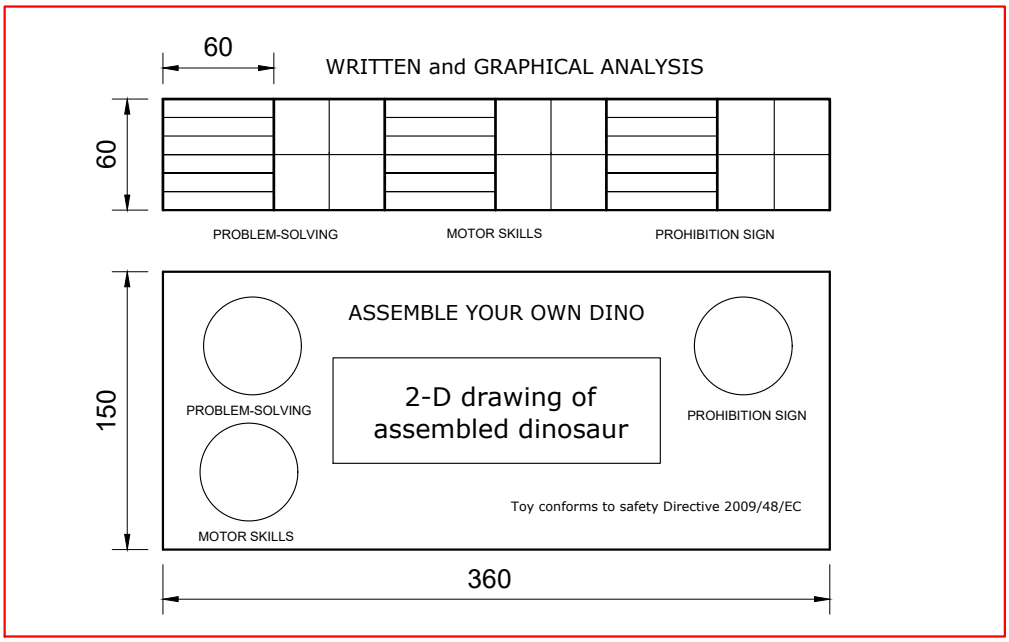

Figure 3b

Question 4.

Figure 4 shows three orthographic views of a drone controller.
You are requested to:

a. make a well-proportioned pictorial (3D) freehand drawing of this controller. (14)
b. colour and shade your drawing using the following instructions: (8)

- body - durable plastic (light grey)
- protruding handles - durable plastic (yellow)
- push buttons - durable plastic (yellow)
- movement sticks - durable plastic (red)
- screens - glass

(Total: 22 marks)

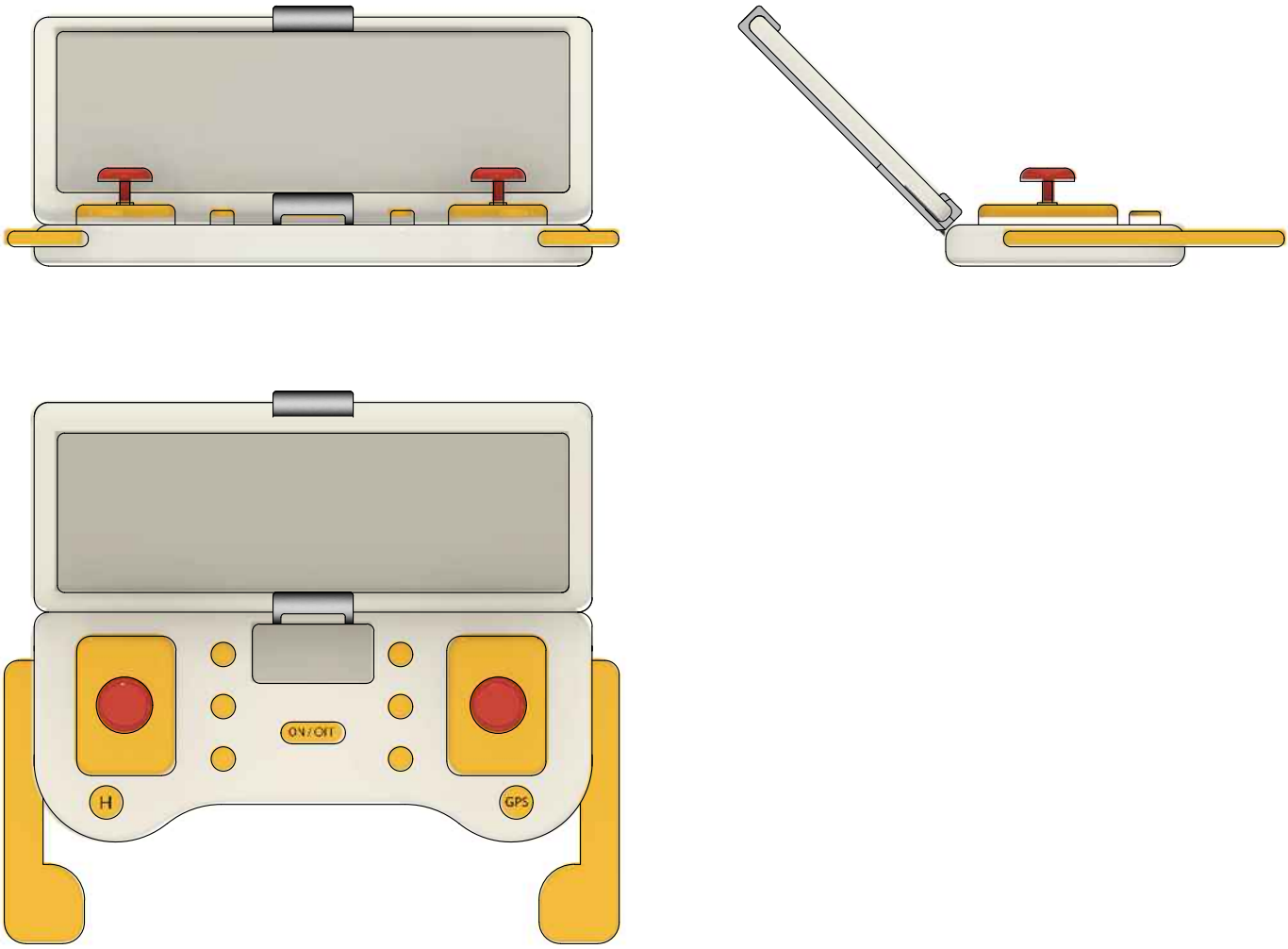

Figure 4

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