AM15/I.26s

L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

ADVANCED MATRICULATION LEVEL
2026 SECOND SESSION

SUBJECT:	**Graphical Communication**
PAPER NUMBER:	I
DATE:	31st August 2026
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.

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Question 1.

The sheet metal quadrilateral ABCD, illustrated pictorially in Figure 1a was bent along corners B and D to form two triangles ABD and CBD. Diagonal BD is the common edge of the two triangles. Orthographic views of the bent quadrilateral are given in Figure 1b.

a. Copy the given views. (1)
b. Project a first auxiliary view to determine the true length of common edge DB. (5)
c. Project a second auxiliary view to determine the dihedral angle between triangles ABD and CBD. (5)
d. Project additional auxiliary views to determine the true shapes of triangle ABD and CBD. (5)

Two cylindrical pipes are to be attached perpendicular to the surface of triangles ABD and CBD.

e. Determine, by construction, the largest diameter of the pipe that can be fitted to triangle ABD. (2)
f. Determine, by construction, the largest diameter of the pipe that can be fitted to triangle CBD. (2)

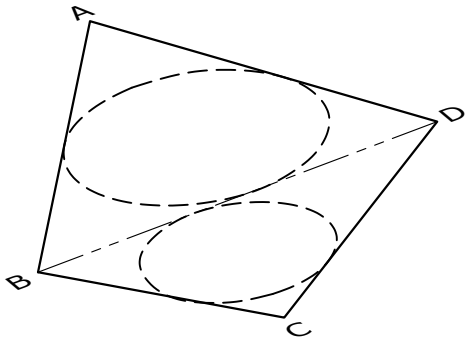


Figure 1a

(Total: 20 marks)

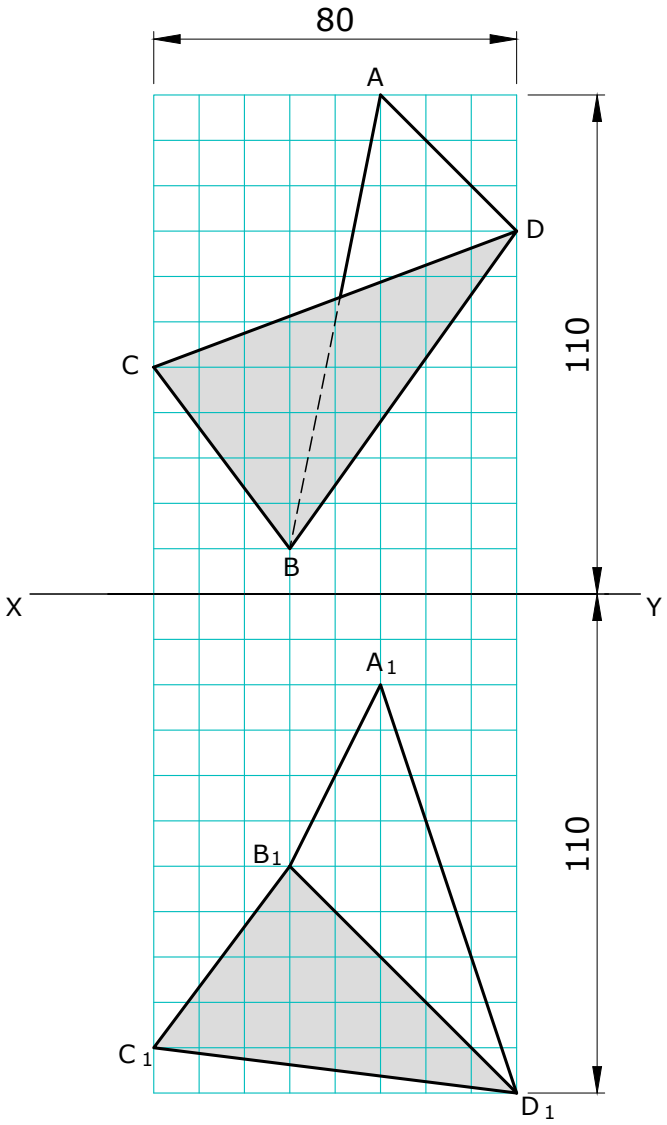


Figure 1b

Question 2.

An illustration of an I beam cut by an oblique plane is shown in Figure 2a.
Two orthographic views and the traces of the oblique plane VTH are given in Figure 2b.

a. Copy the given views. (1)
b. Project an auxiliary front of the solid. (4)
c. Convert the oblique plane into an inclined plane. (2)
d. Project the truncation to the plan. (4)
e. Complete the truncated front elevation. (4)
f. Produce an isometric drawing of the truncated I beam. (4)
g. Indicate the truncation by drawing section lines in all views. (1)

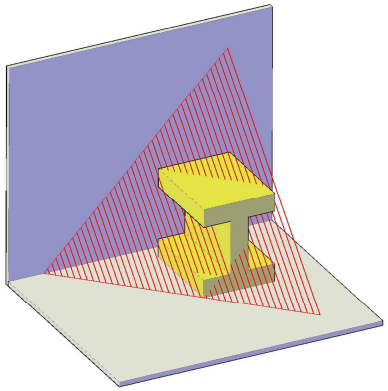


Figure 2a

Notes:

- The section of the I beam above the cutting plane is to be removed.
- Place corner C of the I beam in the lowermost position of the isometric drawing (isometric scale is **not** required).

(Total: 20 marks)

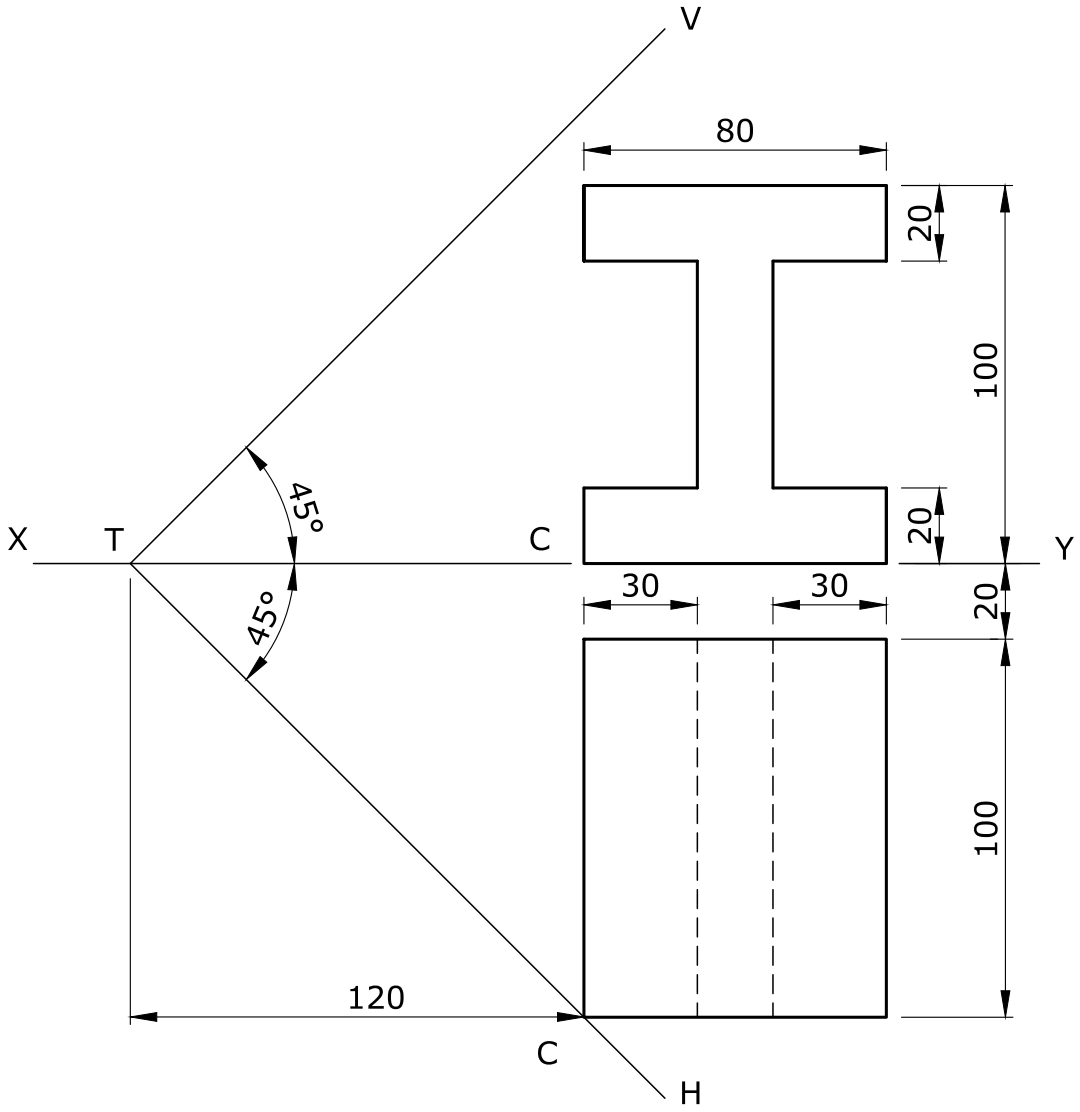


Figure 2b

Question 3.

A pictorial view of an oval to rectangle transition piece is shown in Figure 3a. Orthographic views of the fitting are given in Figure 3b.

a. Copy Figure 3b. (1)
b. Draw the crease lines in both views. (2)
c. Complete the labelling using letters and numbers. (2)
d. Construct the required true lengths and neatly label. (6)
e. Construct a half surface development. (9)

Note:
Take the seam lines of the transition piece at 1X and 8Y.

(Total: 20 marks)

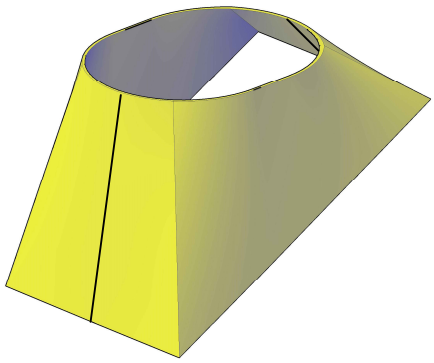


Figure 3a

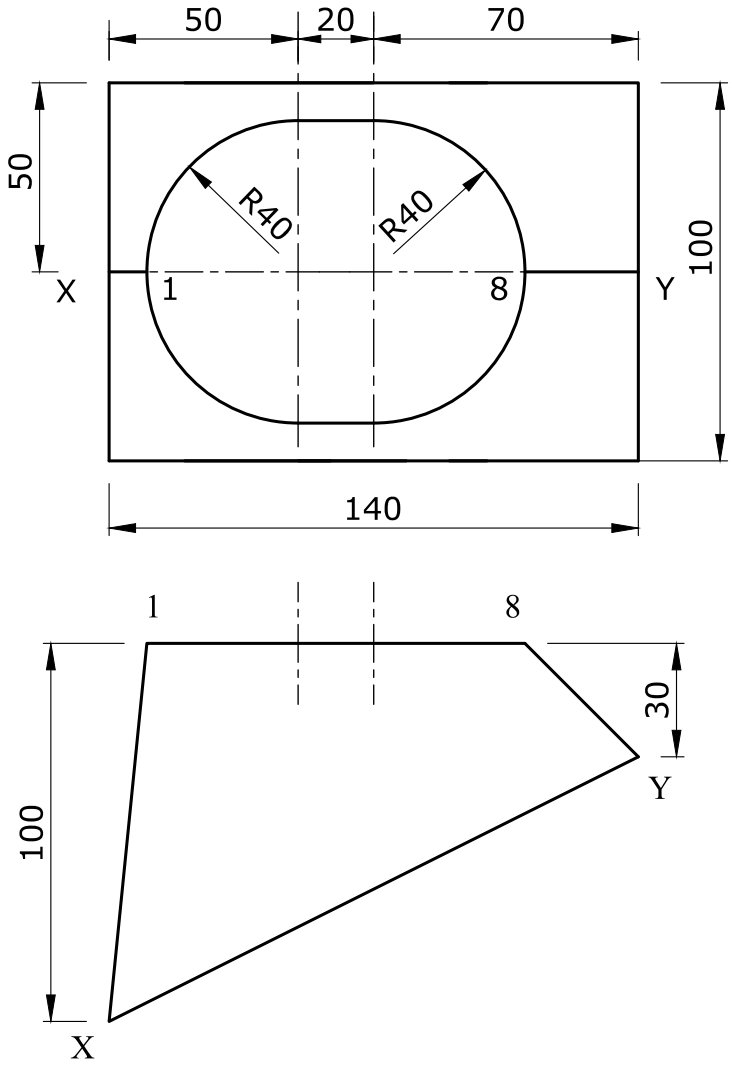


Figure 3b

Question 4.

Figure 4a shows a photograph of a quick action turnbuckle which is used to adjust the tension of cables. It consists of a main body and a right-hand and a left-hand threaded components. Figure 4b describes the set up of a close-up view of the screw threads. Information about the screw threads is given below:



Figure 4a

- Thread profile = V-shape
- Major diameter = 140 mm
- Pitch of thread = 30 mm
- Number of starts = 2
- Hand of thread 'A' = Left
- Hand of thread 'B' = Right

a. Copy Figure 4b. (2)
b. Construct the helical thread on the left-hand side. (8)
c. Construct the helical thread on the right-hand side. (8)
d. State and label the lead of the threads. (2)

Note:
Do not show hidden detail.

(Total: 20 marks)

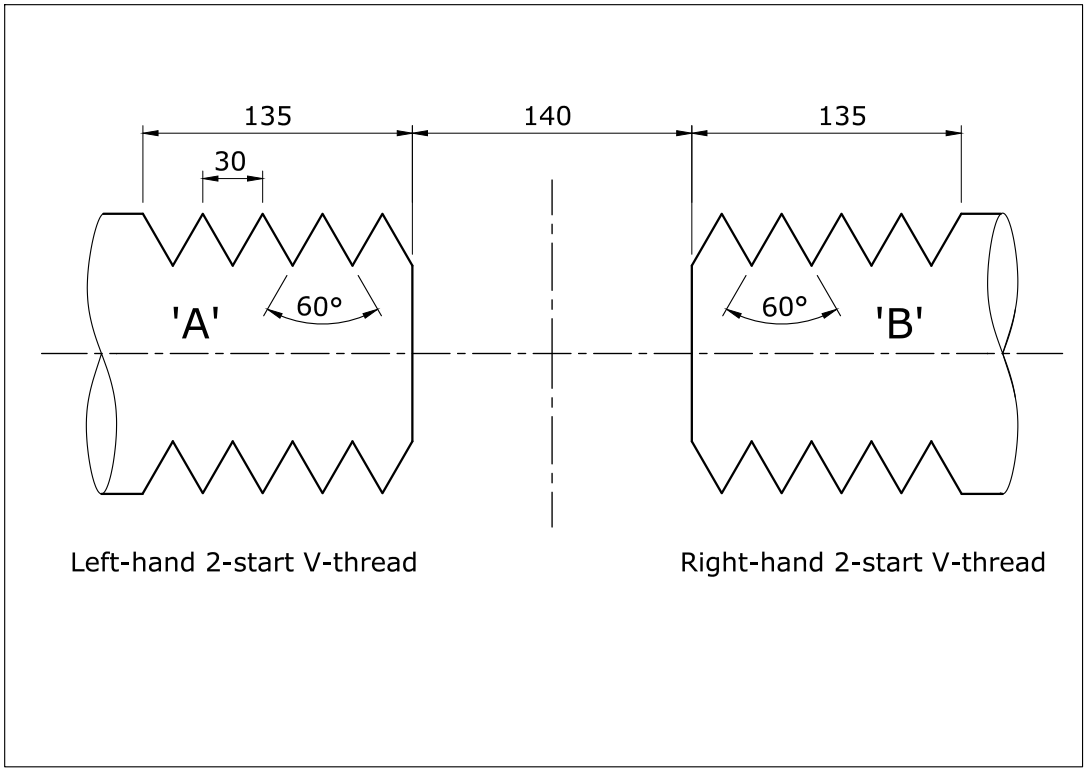


Figure 4b

Question 5.

A right conical container fits inside a hemispherical wall mounted holder as shown in Figure 5a. Incomplete orthographic views of the intersecting geometric solids are given in Figure 5b.

a. Copy Figure 5b. (1)
b. Complete the plan showing clearly the curve of intersection. (8)
c. Complete the front elevation. (8)
d. Complete the end elevation. (3)

Notes:
- Show hidden detail.
- The conical container has negligible thickness.

(Total: 20 marks)

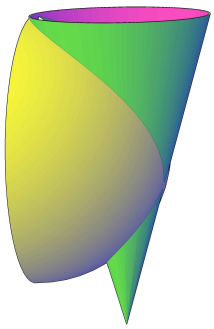


Figure 5a

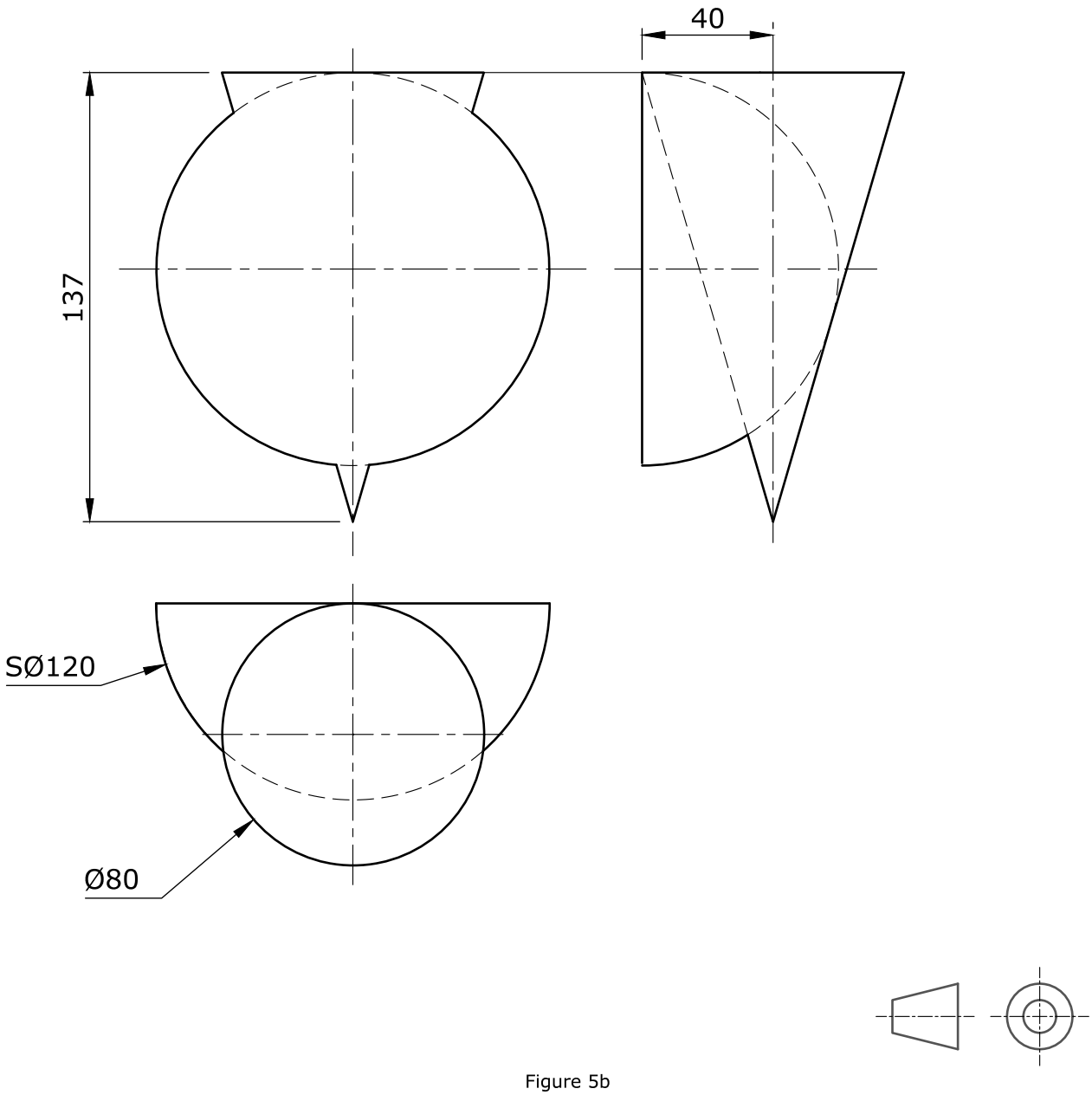


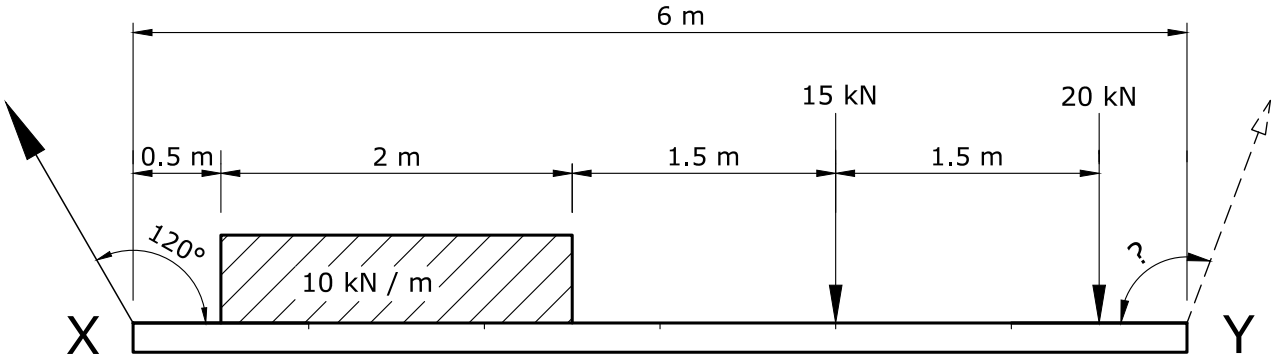
Figure 5b

Question 6.

The beam shown in Figure 6 is supported by two tie rods, one at end X and one at end Y. The beam, which weighs 25 kN, carries point loads and a udl. The inclination of the tie rod at X is given while the inclination of the tie rod at Y is unknown.

a. Copy the space diagram given in Figure 6 using the given scale. (1)
b. Apply Bow's notation. (1)
c. Draw the loadline and polar diagram by using the given force diagram scale. (4)
d. Combine the applied loads into a single force. (1)
e. Determine the position of the resultant force. (3)
f. Locate and label the point of concurrency. (2)
g. Determine the tension in the tie rod at X. (3)
h. Determine the tension and inclination in the tie rod at Y. (5)

(Total: 20 marks)



SPACE DIAGRAM SCALE: 30 mm = 1 m

FORCE DIAGRAM SCALE: 2 mm = 1 kN

SUGGESTED POLAR DISTANCE = 100 mm

WEIGHT OF BEAM = 25 kN

Figure 6

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Question 1.

Figure 1 shows three orthographic views of the model of a bus station. These orthographic views 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. (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 illustration. (5)

(Total: 34 marks)

Notes:

- The main structure is made to look as stone and reinforced concrete.
- The bin, the bench, and the sign as stainless steel.
- The floor area is paved with non-slip tiles.

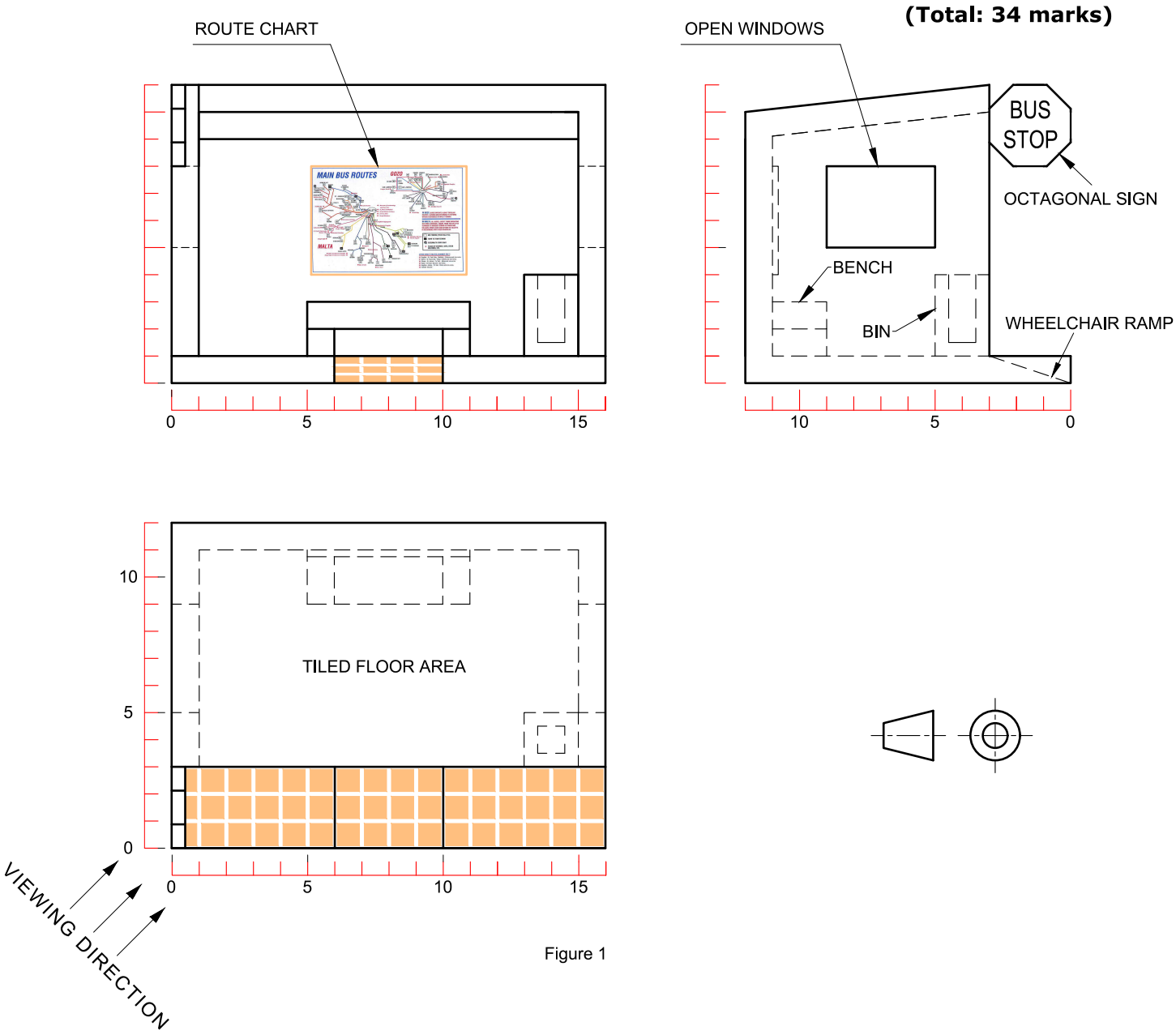


Figure 1

Question 2.

'Video AI', whose logo is shown in Figure 2a, is an artificial intelligence software that enhances video editing and production. Your task is to design a visually compelling and informative two-page spread advert to promote this software. The tagline of the advert is "*Edit like a professional*".



Figure 2a

Keep in mind the following principles to guide your design:

- The advert should convey a sense of innovation and professional quality.
- You should establish a clear visual hierarchy to guide the viewer's eyes through the spread.
- Select appropriate typography for titles, subtitles, and body text, that reflect the brand's modern corporate image. Ensure all text is legible and contributes to the overall message.
- Include images that demonstrate the software's capabilities.
- Maintain a consistent colour palette.

a. Written analysis
Identify, using keywords/short phrases, the main parameters of the design brief. (2)

b. Graphical analysis
Based on your response to the written analysis, produce a series of preparatory sketches that illustrate your developing ideas. (4)

c. Design synthesis
Clearly identify those elements present in your sketches that you intend to use in your final design. (2)

d. Final realisation
Use colour and shading to produce your final realisation. (14)

Notes:

- Details of the page layout and the design space are shown below.
- The fold line is shown for indication purposes only; where page 1 ends and page 2 begins.

(Total: 22 marks)

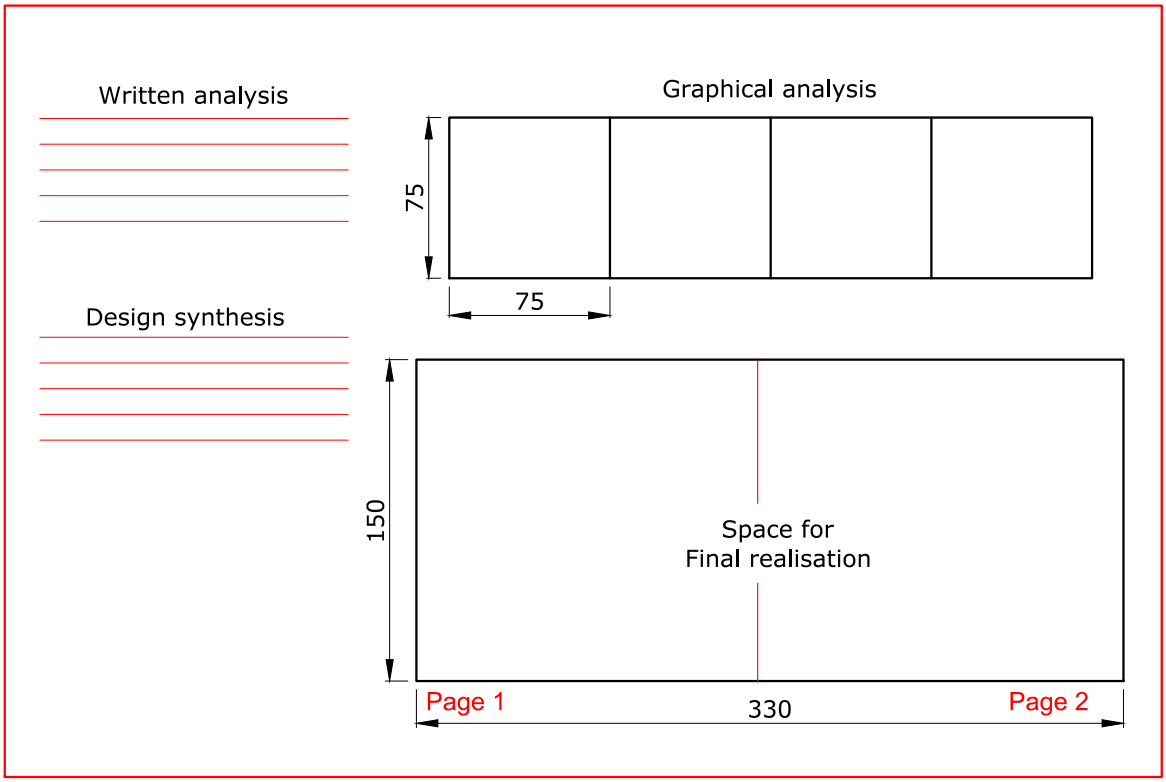


Figure 2b

Question 3.

The labelled illustration in Figure 3a shows a desk sharpener with all its components.
The statements below indicate how this sharpener is operated.

Step 1. Clamp the sharpener firmly to the desk.
Step 2. Squeeze the release mechanism to open the cutting chamber and pull it horizontally outward.
Step 3. Insert the pencil in the cutting chamber and release the pressure on the release mechanism.
Step 4. Turn the rotary handle clockwise until the pencil is sharpened. When the pencil is fully sharpened, the pressure on the handle will be released.
Step 5. Remove the pencil from the cutting chamber by squeezing the release mechanism once again.
Step 6. Open the pencil shaving bin and dispose of the pencil shavings.

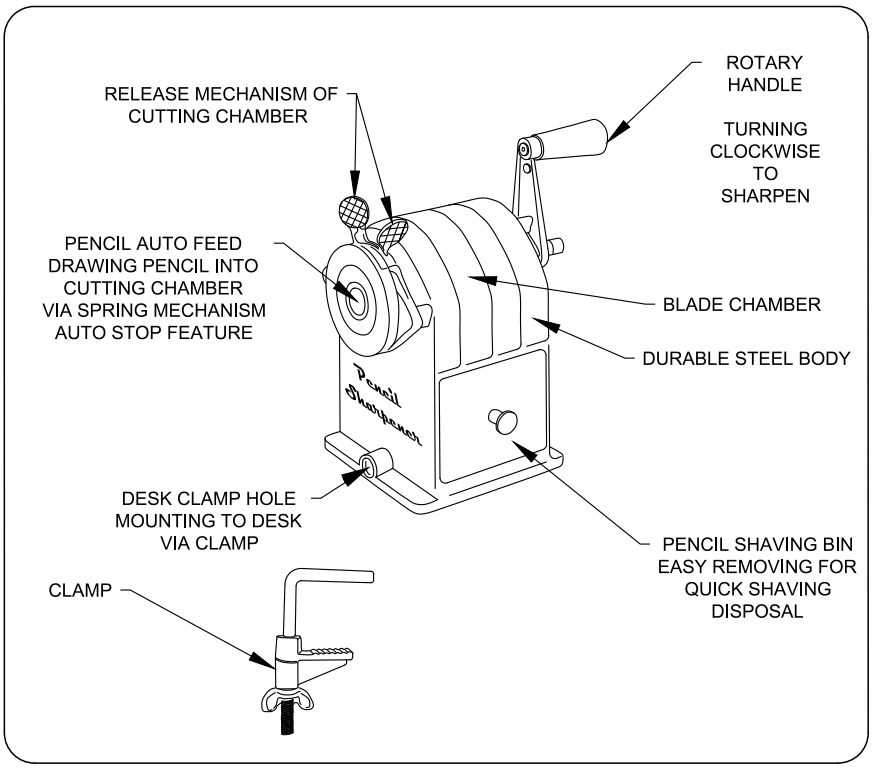


Figure 3a

a. Create freehand preparatory sketches to illustrate **each** of the above statements. (6)
b. Draw the final illustrations. (16)

Note:
- Use motion arrows to indicate the passage of moving parts.
- It is suggested that the solution is presented as indicated in Figure 3b.

(Total: 22 marks)

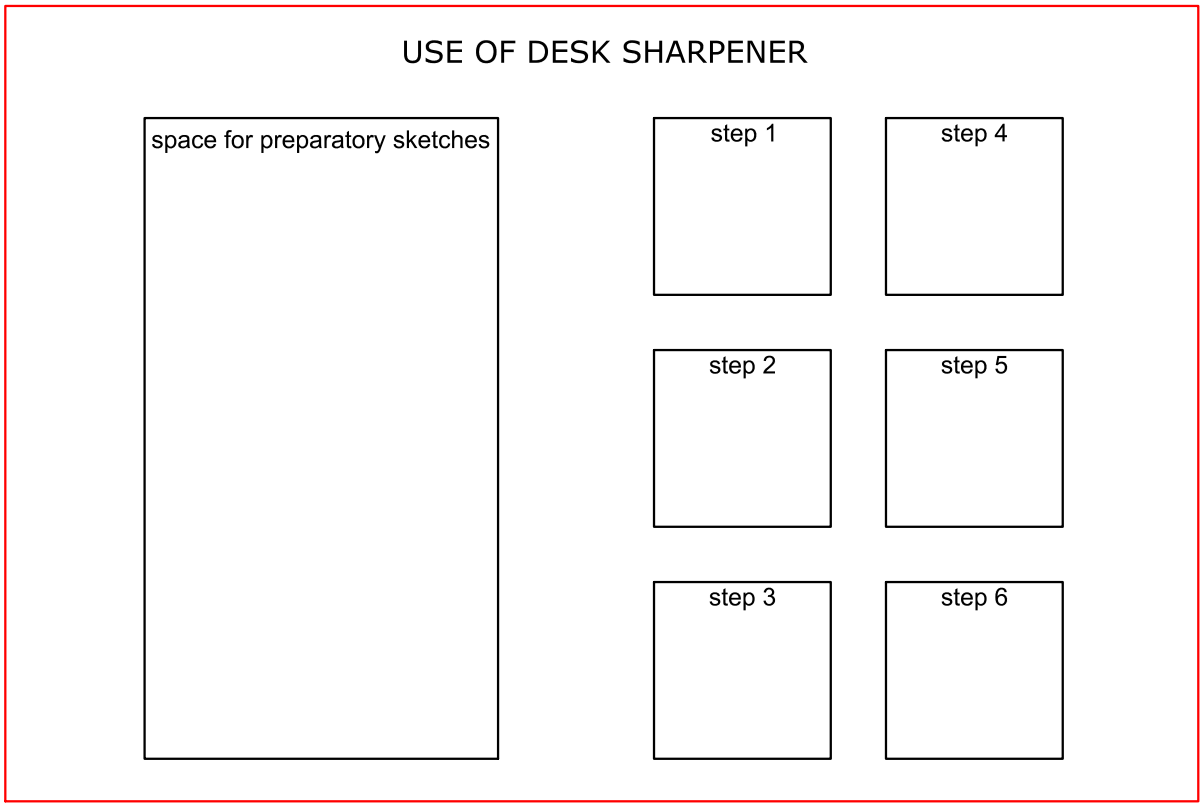


Figure 3b

Question 4.

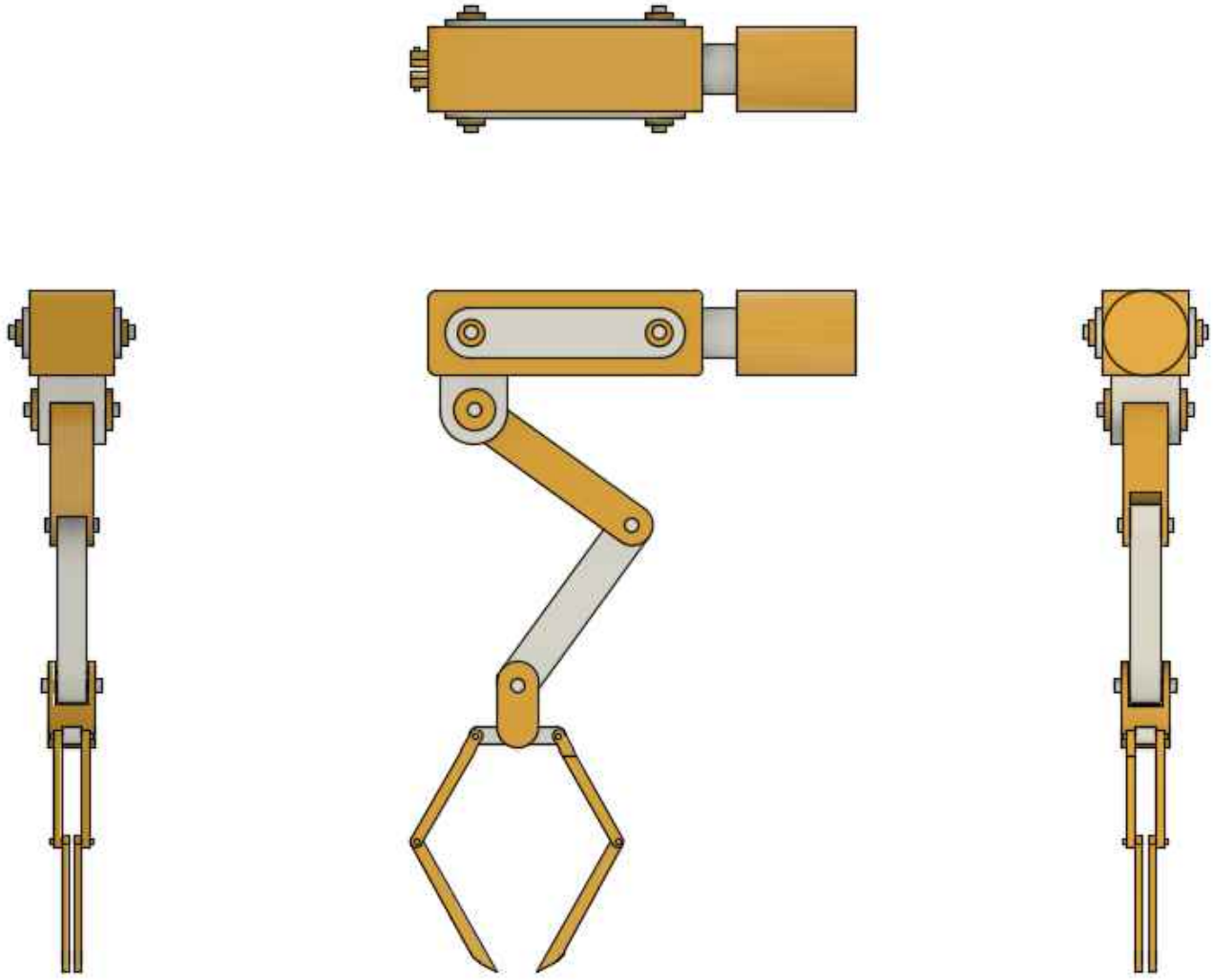
Four orthographic views of a robotic arm are shown below.

You are requested to:

a. make a well-proportioned freehand isometric drawing of this robotic arm, as seen from an angle that best describes the function of the arm. (14)

b. colour and shade your drawing using the following instructions:
- main body - spray coated steel (6)
- pincers - polished steel (2)

(Total: 22 marks)



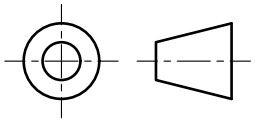


Figure 4