City University London

Term 1 Assessment 2008/2009

School of Engineering and Mathematical Sciences

ME1105 Engineering Drawing & Design

SOLUTIONS

Student Name: ..... Group: .....

Max. No of Marks: **30**

Examination duration: 80 minutes
Reading time: 10 minutes
This paper has: 9 pages

Authorized materials:

Electronic calculators and drawing instruments may be used.

Instructions to invigilators: Candidates are to complete the examination by writing and drawing **in this examination paper**, which must be collected at the end of the examination. No additional script books should be required.

Instructions to students:

Attempt **all** of the five questions. All questions are of equal value.
Space is provided **in this paper** to complete all the questions. No additional script books should be required. The whole paper must be left for collection by the invigilators at the end of the examination.

Be sure to write your student name and group in the space provided above.

Q1: **6 mark**s
Each correct answer 0.15 marks

Question 1

Indicate whether the following statements are **T**rue or **F**alse by **ticking** the appropriate selection box.

T	F	
	X	Technical sketching is only appropriate for fine detail work near the conclusion of the design process.
	X	Technical sketching is only appropriate for capturing simplified conceptions of the design very early in the design process.
X		Ideation sketches are often done quickly in order to explore as many design ideas as possible.
	X	The width and depth axes of an isometric sketch are drawn 45° above the horizontal.
X		A principal view in a sketch is always at right angles to the other principal views.
	X	The principal view is another name for the front view.
	X	An edge is only associated with one face in a solid object.
X		A face is joined to other faces via edges.
X		Perspective projection creates a more realistic image of an object than parallel projection.
	X	A perspective pictorial drawing is less realistic but easier to draw than an isometric pictorial.
	X	Parallel projection can only be used with objects with parallel edges.
X		A multiview and axonometric pictorial both use parallel projection.
X		Orienting a face and the projection plane so that they are parallel creates an edge view of the face.
X		In a valid wireframe model, each face must contain at least three vertices and form a closed loop.
X		One problem with wireframe models is ambiguity.
X		When laying out orthographic views, it is the usual practice to consider the frontal plane as lying in the plane of the paper, and the horizontal and profile planes as being rotated into the frontal plane.
	X	Perspective projection is sometimes substituted for parallel projection in a multiview projection.
	X	The top view is always vertically above the front view, but the side view may not always be horizontally in line with the front view.
X		The right side view is created using a profile plane of projection.
X		The front of the object in both the top and side views faces the front view.
	X	There are only three principal views of an object.
X		First-angle projection is the multiview projection convention used in UK.

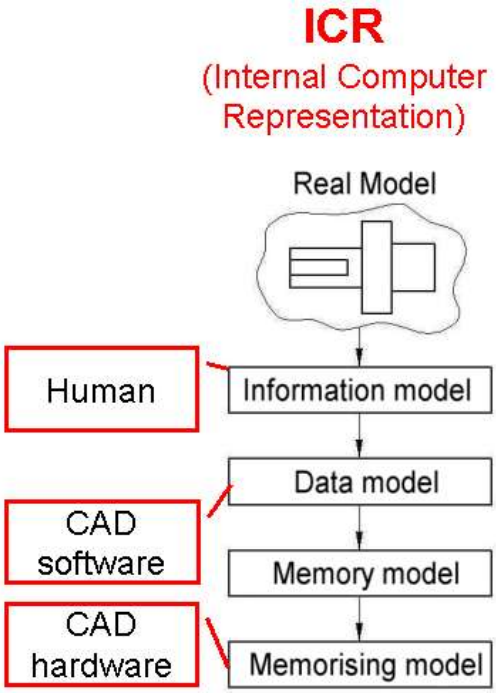
T	F	
	X	Ordinarily, in selecting the front view, the object is placed to obtain the smallest number of hidden surfaces.
	X	In making an orthographic multiview drawing, one view should be completed before starting the others.
X		The alphabet of lines is specified by British standards.
	X	Points of tangency between surfaces are represented with centre-lines in a multiview drawing.
X		A fillet is a rounded interior corner.
X		In making any orthographic multiview drawing, true projection is never violated.
X		An isometric drawing of an object is slightly larger than the isometric projection.
X		Hidden lines should be omitted on an isometric drawing, unless absolutely necessary for clarity.
	X	The angles of an inclined line in an orthographic view can be transferred directly to an isometric drawing.
X		An oblique drawing is drawn with features in two of the dimensions in true size and shape.
X		A cabinet oblique view is drawn true length along the receding axis.
X		An auxiliary view of an inclined surface is not one of the principal views.
X		A tertiary auxiliary view is used to show the true size and shape of an oblique surface.
X		An auxiliary view of an inclined surface is generated by defining a line of sight perpendicular to its normal view.
	X	An auxiliary view of an inclined surface is generated by defining a line of sight perpendicular to its edge view.
	X	An oblique line will appear foreshortened in all three principal projection planes.
X		In a sectional view, it is considered good practice to omit all hidden surfaces unless such surfaces are necessary to clarify the representation of the object.
	X	For an offset section, it is common practice to use visible lines in the section view to show the bends in the cutting plane.
X		Thin features, such as webs, are left unsectioned when cut parallel to the feature by the cutting plane.
X		A half section is used when a view is needed showing both the exterior and interior constructions of a symmetrical object.
X		A revolved section is a section, which has been rotated 90° and placed adjacent to the orthographic view.
	X	A detail drawing is a complete set of standardized drawings specifying the manufacturing and assembly of a product.
X		An assembly drawing shows how a group of parts in a design go together.
	X	In an assembly drawing, standard parts such as fasteners bushings, bearings, etc. are not drawn as details.

Q2: **6 marks**
Q2a: **3/6 marks** ; Q2b: **3/6 marks**

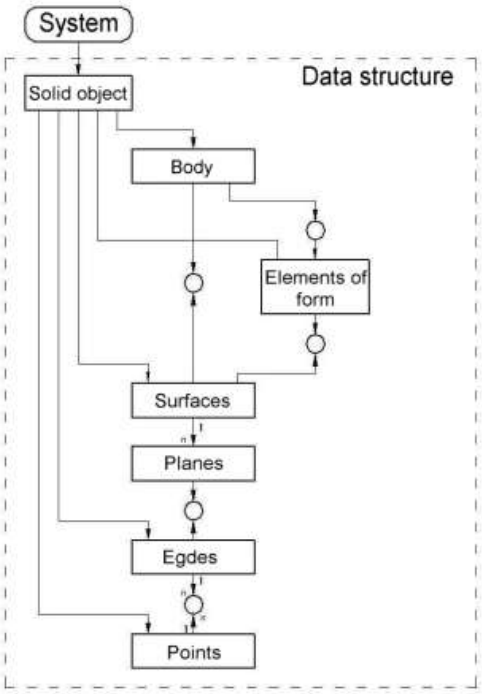
Question 2

Internal Computer Representation (ICR) is the method by which real object is represented in the computer memory by the CAD system.

(a) List 4 phases of the ICR and outline which component of CAD system is responsible for which of these phases.



(b) Describe **information model** in more details and list all 5 types of information models. Describe which of these is used in AutoCAD.



1. Information model:
   - » Real world→ → set of primitives
     - – 2D
     - – 2½ D
     - – 3D Wireframe
     - – 3D Surface
     - – 3D Solid

Q3: **6 mark**s
a) Each correct answer 0.25 marks
b) Top view 1.5, Isometric 1.5 marks

Question 3

Match isometric views indicated with letters and orthographic views indicated by numbers in figure 2 by writing appropriate number next to letters of isometric views.

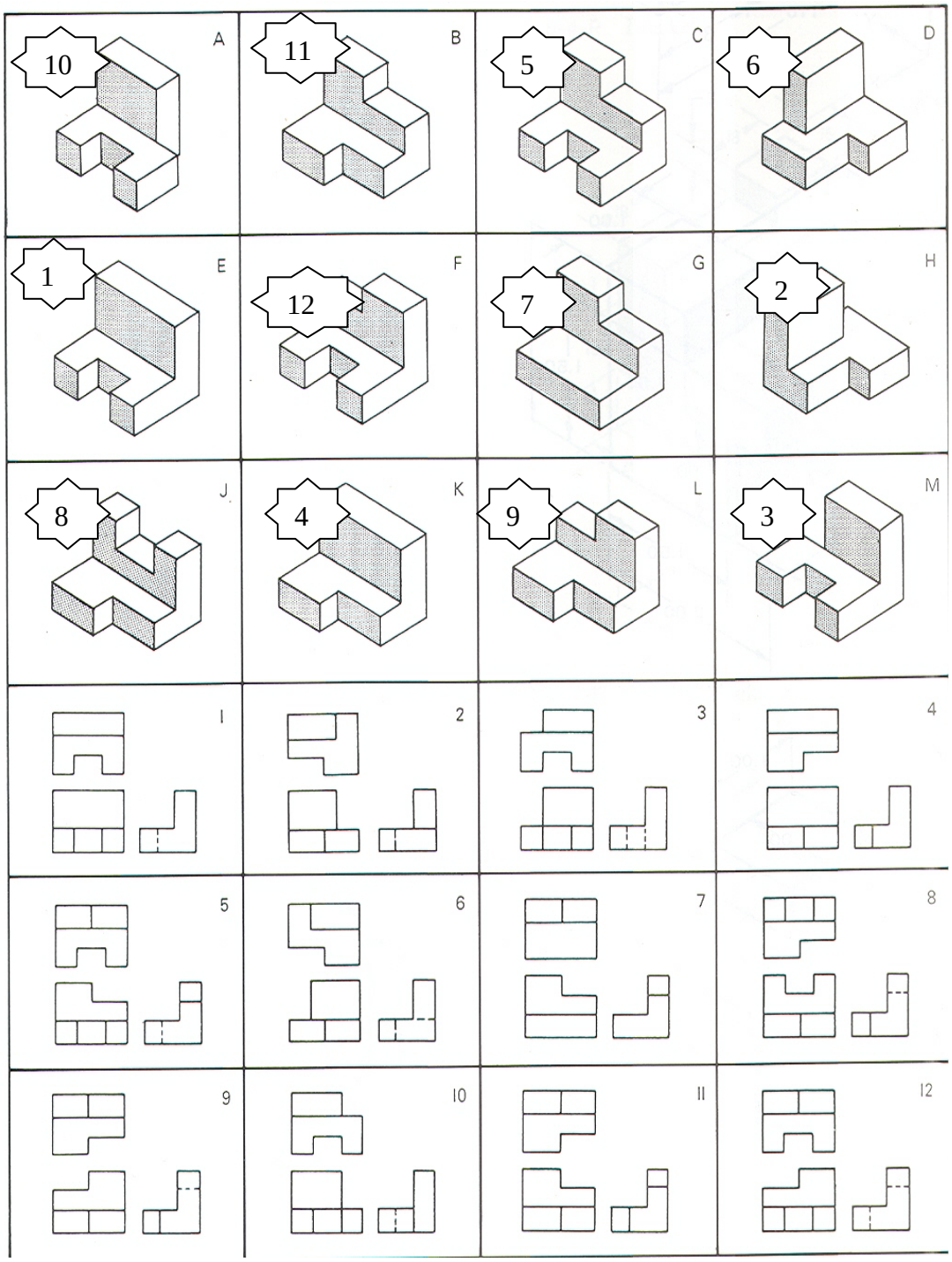


Figure 2

(b) Two views of a multiview drawing of an object are given in figure 3. Draw the missing view and make an isometric sketch of the object.

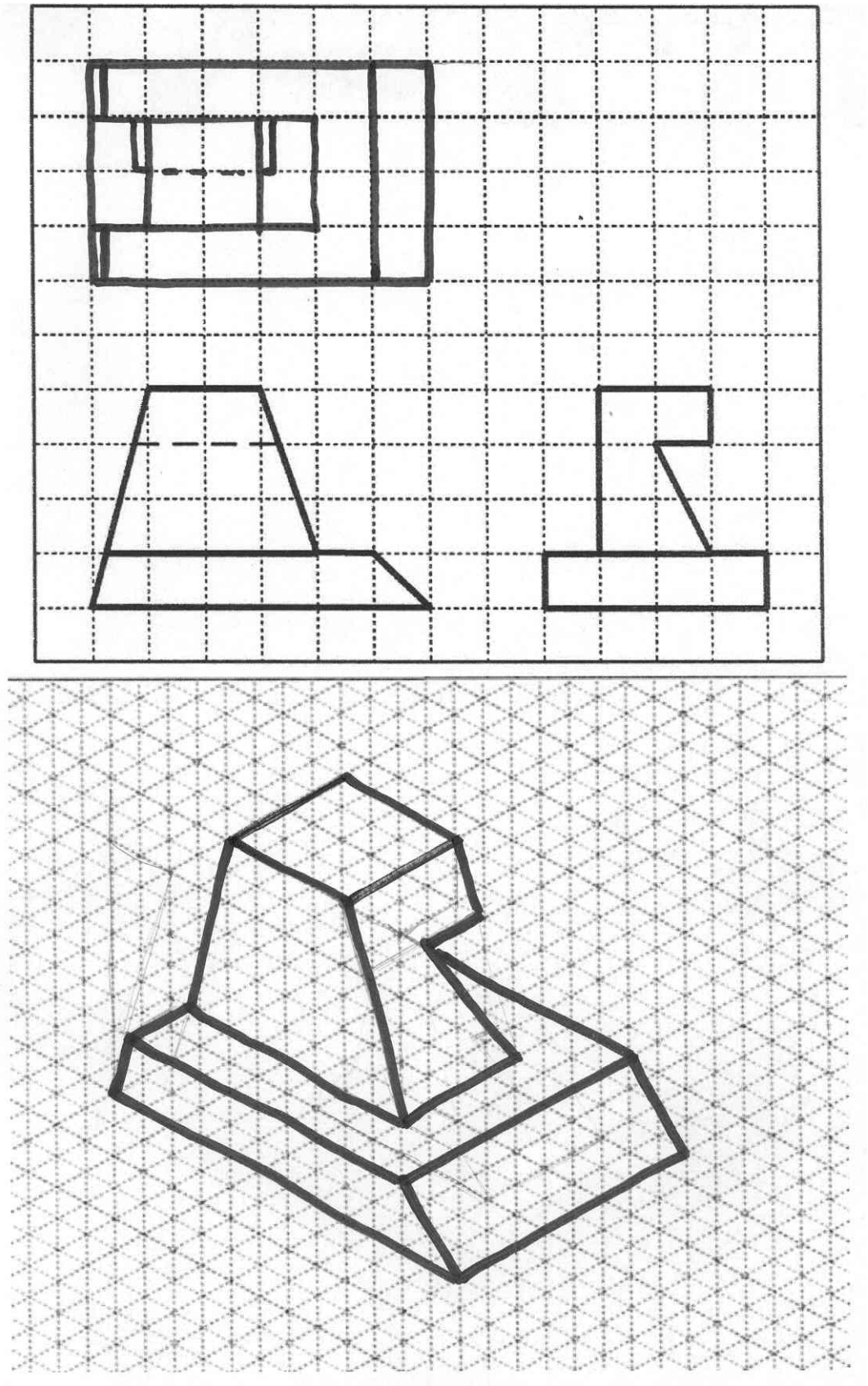


Figure 3

Q4: **6 marks**
Each orthographic view 0.5 marks
Each Isometric view 1 mark

Question 4

Complete orthographic and isometric views in figure 4

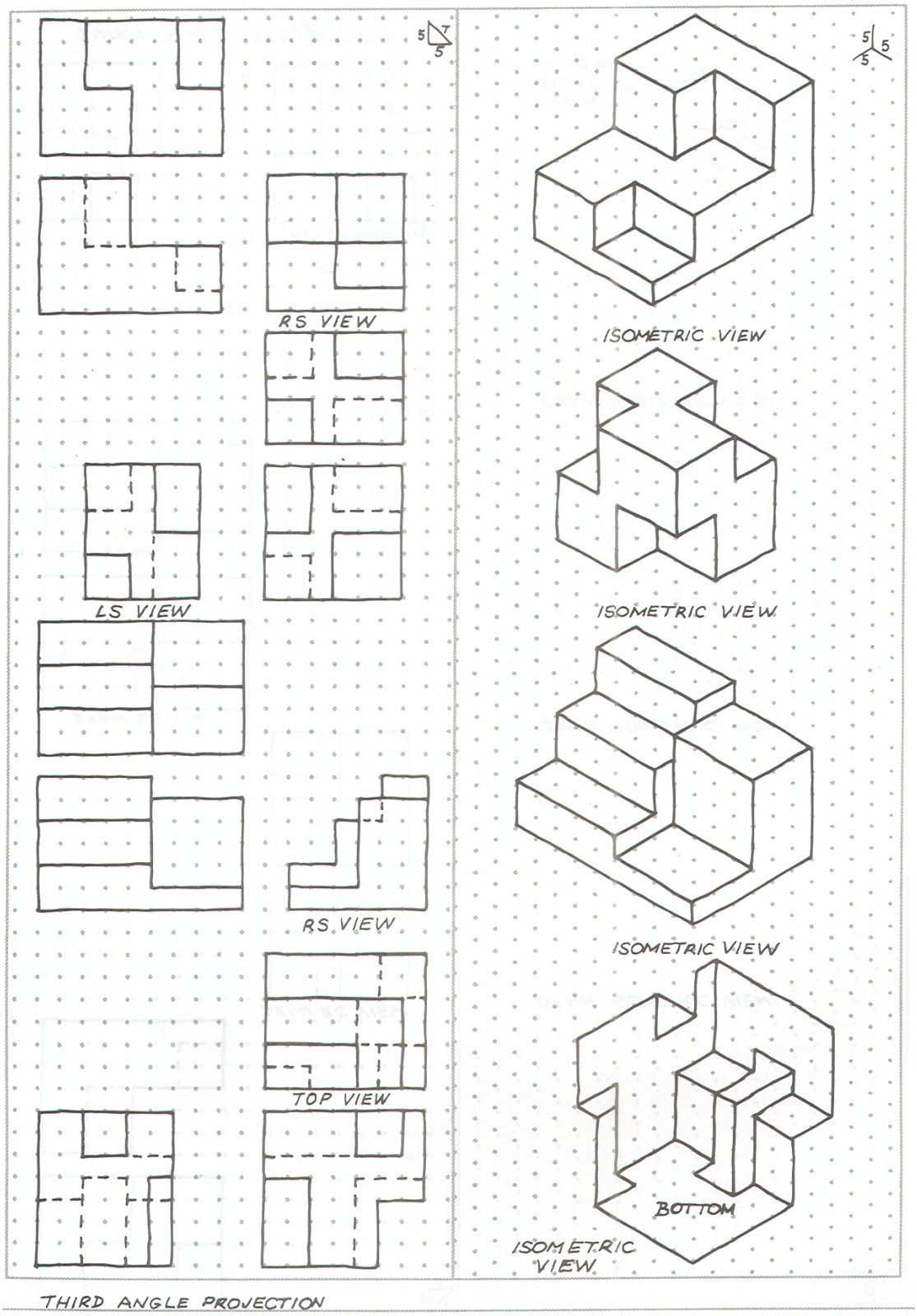


Figure 4

Question 5

Q5:	**6 mark**s Each view 1 mark; Dimensions 3 marks

An isometric view of a cast iron 'frame guide' is shown in figure 5.

Make a fully-dimensioned, multiview detail drawing of the frame guide on page 9, where a convenient layout of views is suggested. Use 3rd angle projection.

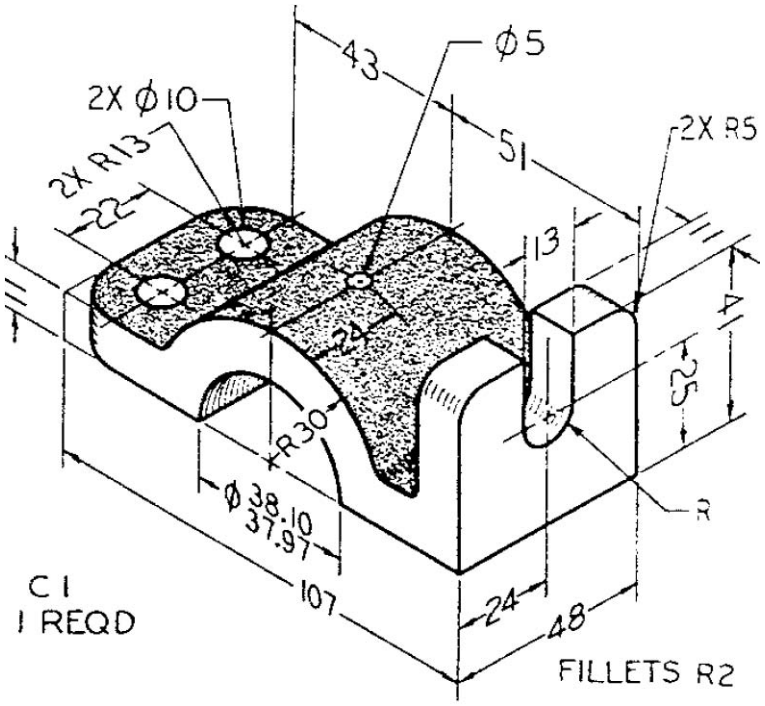
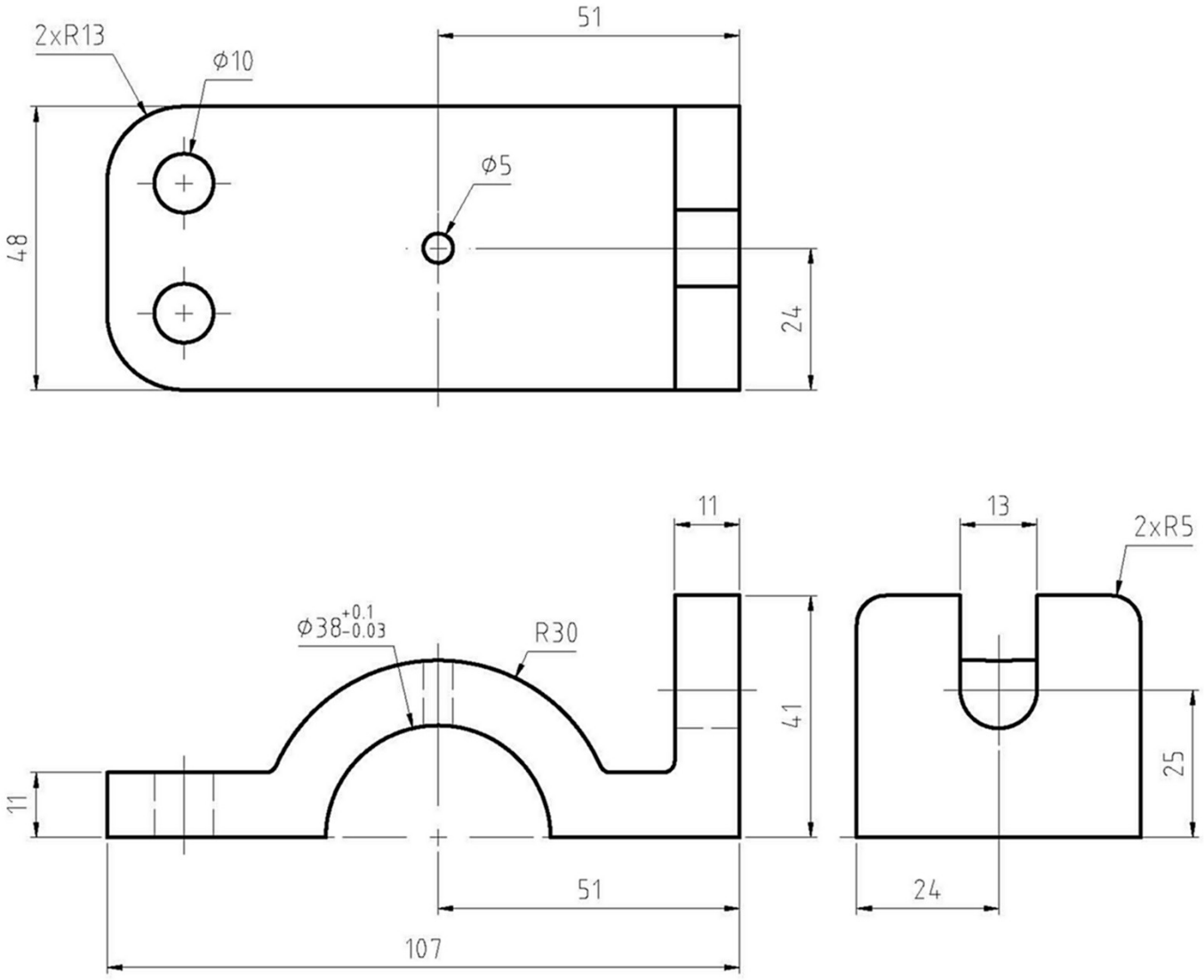


Figure 5


2xR13
ϕ10
51
ϕ5
48
24
11
13
2xR5
ϕ38 +0.1 -0.03
R30
41
25
11
51
24
107