City University London

Term 1 Assessment, 2006/2007

School of Engineering and Mathematical Sciences

ME1105 Engineering Drawing & Design

Student Name: ……., Group: ……

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.
Enough 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 name and group in the space provided above.

Question 1

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

T	F	
		Technical sketching is only appropriate for fine detail work near the conclusion of the design process.
		Ideation sketches are often done quickly in order to explore as many design ideas as possible.
		Technical sketching is only appropriate for capturing simplified conceptions of the design very early in the design process.
		The width and depth axes of an isometric sketch are drawn 45° above the horizontal.
		A principal view in a sketch is always at right angles to the other principal views.
		An edge is only associated with one face in a solid object.
		A face is joined to other faces via edges.
		The principal view is another name for the front view.
		Perspective projection creates a more realistic image of an object than parallel projection.
		A perspective pictorial drawing is less realistic but easier to draw than an isometric pictorial.
		Parallel projection can only be used with objects with parallel edges.
		A multiview and axonometric pictorial both use parallel projection.
		In a valid wireframe model, each face must contain at least three vertices and form a closed loop.
		One problem with wireframe models is ambiguity.
		Orienting a face and the projection plane so that they are parallel creates an edge view of the face.
		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.
		Perspective projection is sometimes substituted for parallel projection in a multiview projection.
		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.
		The right side view is created using a profile plane of projection.
		The front of the object in both the top and side views faces the front view.
		First-angle projection is the multiview projection convention used in UK.
		There are only three principal views of an object.

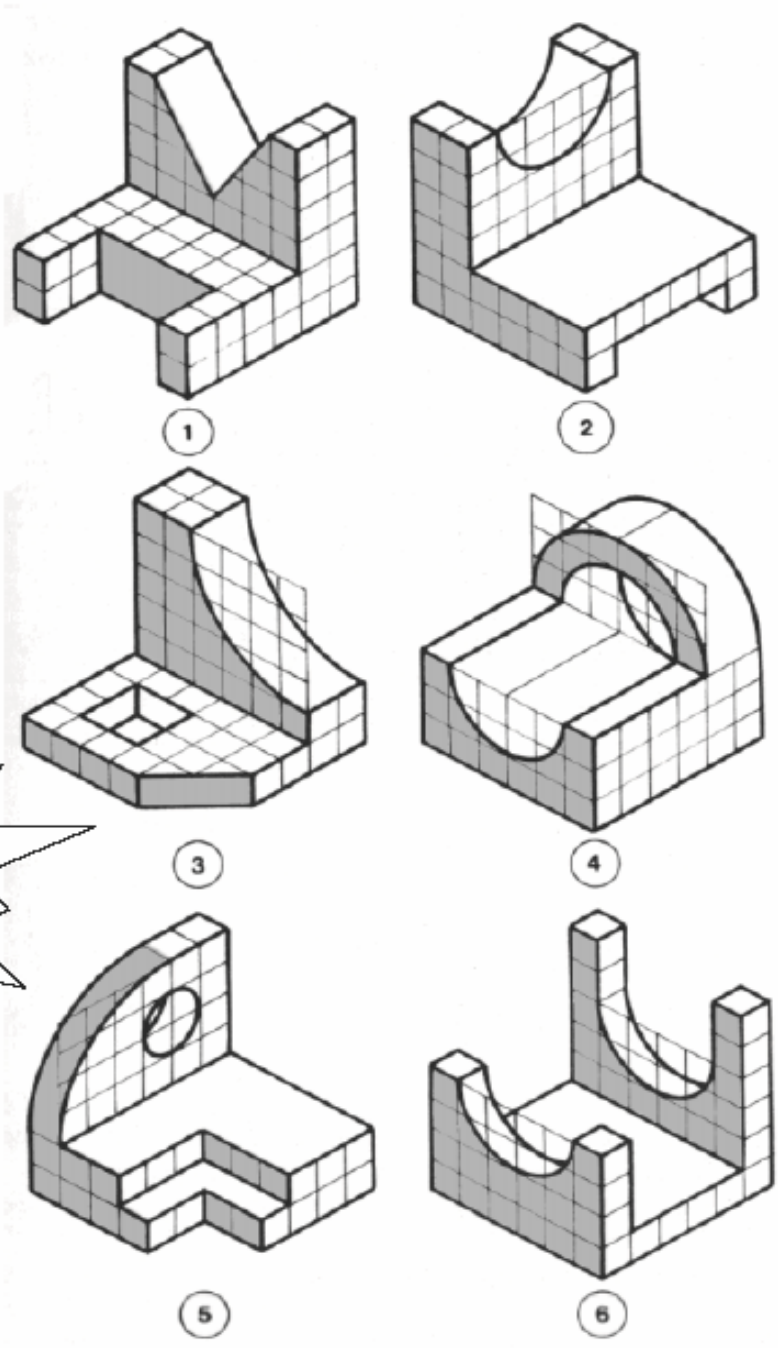
T	F	
		Ordinarily, in selecting the front view, the object is placed to obtain the smallest number of hidden surfaces.
		In making an orthographic multiview drawing, one view should be completed before starting the others.
		Points of tangency between surfaces are represented with centre-lines in a multiview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

Question 2

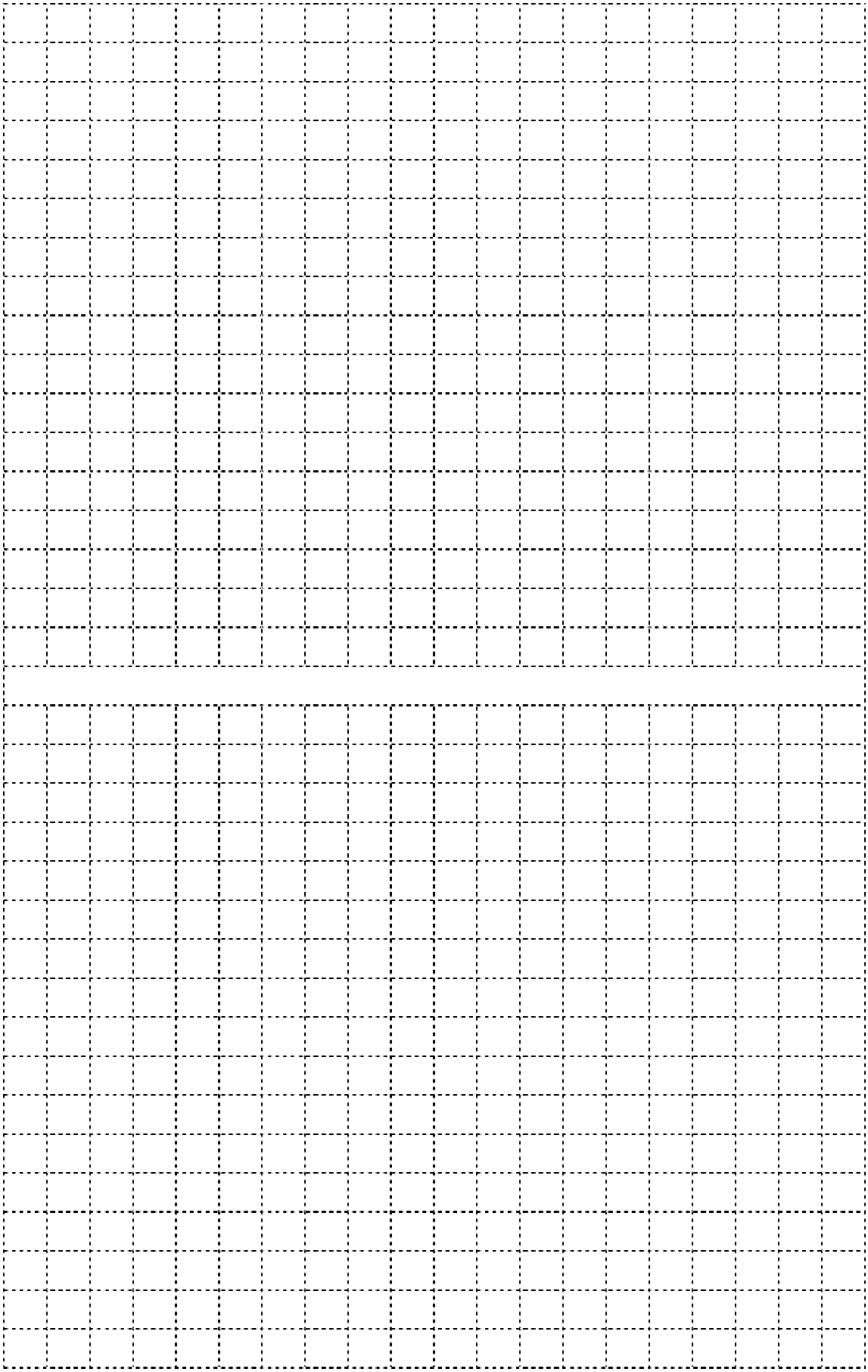
- Use the A4 paper provided. Fill in the title boxes, including the appropriate projection symbol.
- Draw freehand or with a straight edge, using a pencil.
- Assume one square on the pictorial view below equals one square on the drawing sheet.
- Front view should be in the direction of the shaded faces.

1) Choose one of the six components shown here and create a **1st angle projection** drawing of it, showing the **Front** view, the **Left Side** or **Right Side** view and the **Plan** view.

2) Choose another one of the components and create a **3rd angle projection** drawing showing the **Front** view, the **Left Side** or **Right Side** view and the **Plan** view.



Remember: think about where the plan / front view will be placed.



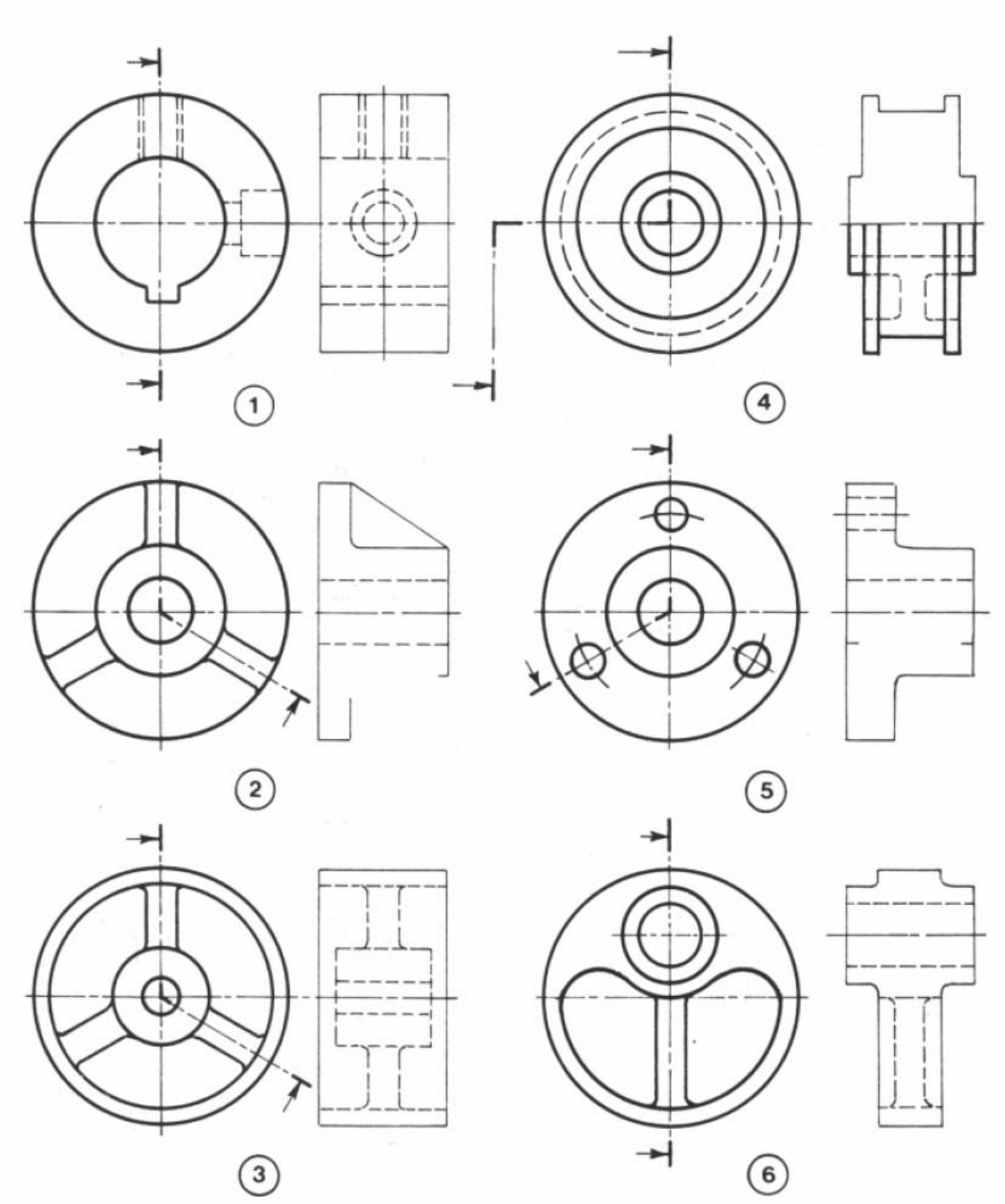
Question 3

a) Define what the Engineering design process is.

b) Define what a FIT is and list the classification of fits (three categories). Briefly explain each of these categories.

Question 4

For the six components below complete the end section as indicated using correct line styles, thicknesses and hatching.



Question 5

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

Make a fully-dimensioned, multiview detailed drawing of the frame guide on page 9. Use 3rd angle projection.

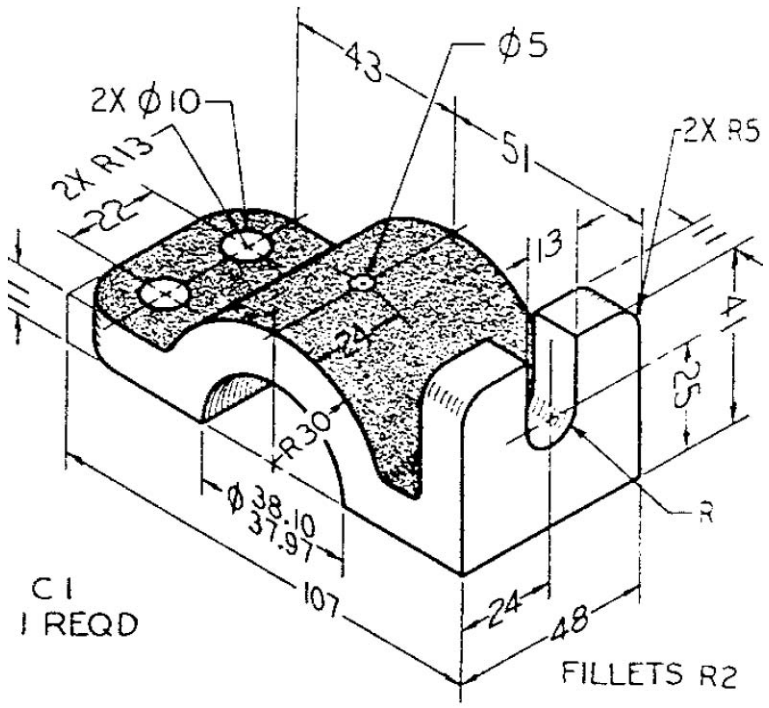


Figure 5