Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2012

Design & Communication Graphics
Ordinary Level
Sections B and C (180 marks)

Wednesday, 20 June
Afternoon, 2.00 - 5.00

This examination is divided into three sections:

SECTION A   (Core - Short Questions)
SECTION B   (Core - Long Questions)
SECTION C   (Applied Graphics - Long Questions)

SECTION A
- Four questions are presented.
- Answer **any three** on the accompanying A3 examination paper.
- All questions in Section A carry **20 marks** each.

SECTION B
- Three questions are presented.
- Answer **any two** on drawing paper.
- All questions in Section B carry **45 marks** each.

SECTION C
- Five questions are presented.
- Answer **any two** (i.e. the options you have studied) on drawing paper.
- All questions in Section C carry **45 marks** each.

General Instructions:
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box provided on section A and on all other sheets used.*
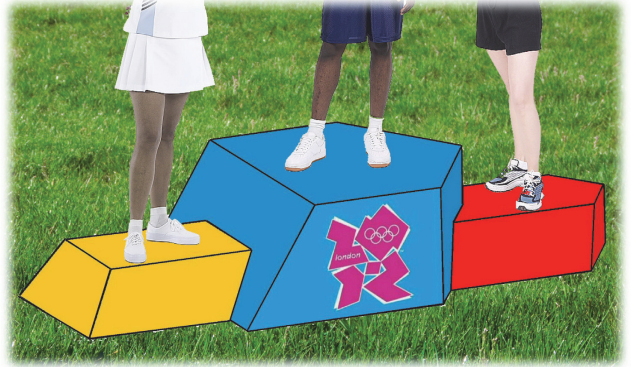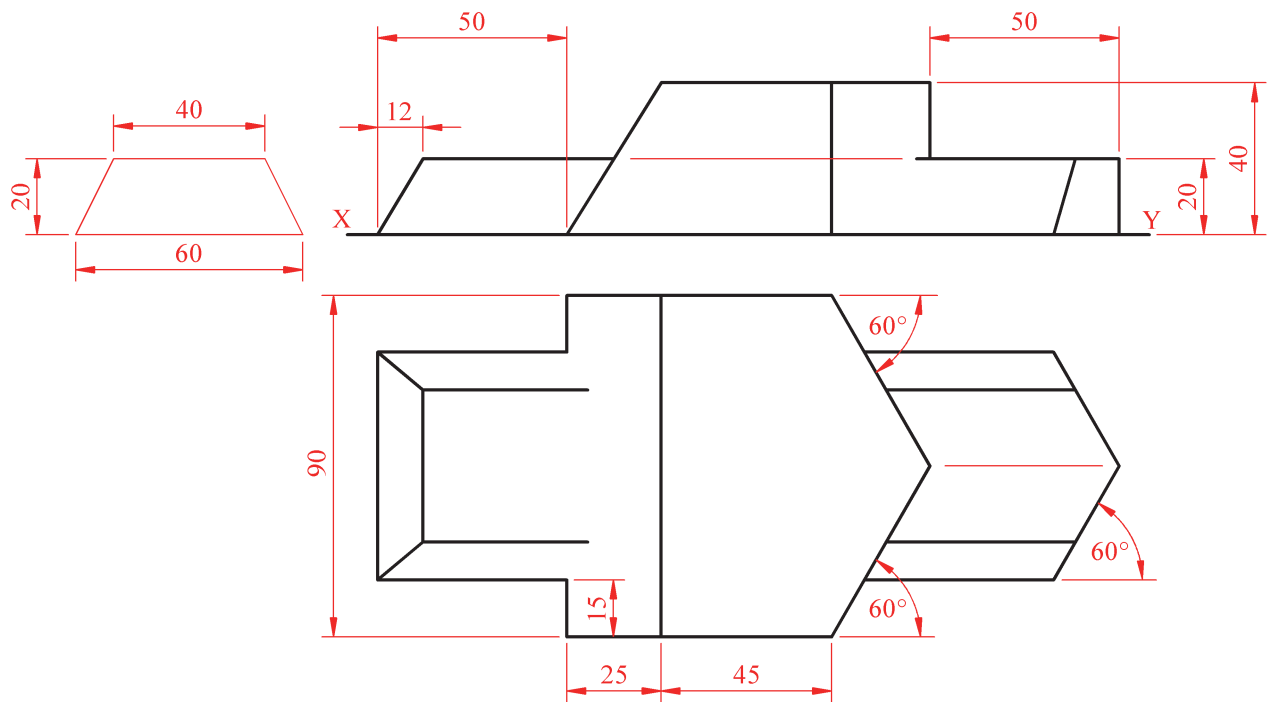
B-1. The 3D graphic on the right shows a design for a podium for this year's Olympic Games.

Fig. B-1 below shows the plan and elevation of the podium.

(a) Draw the given plan and elevation of the podium and show all lines of interpenetration.

**(b)** Draw an end view of the podium.

Scale 1:1

Fig. B-1

B-2. The 3D graphic on the right shows a table tennis table.

Fig. B-2 below shows the plan and elevation of a model of the table and net.
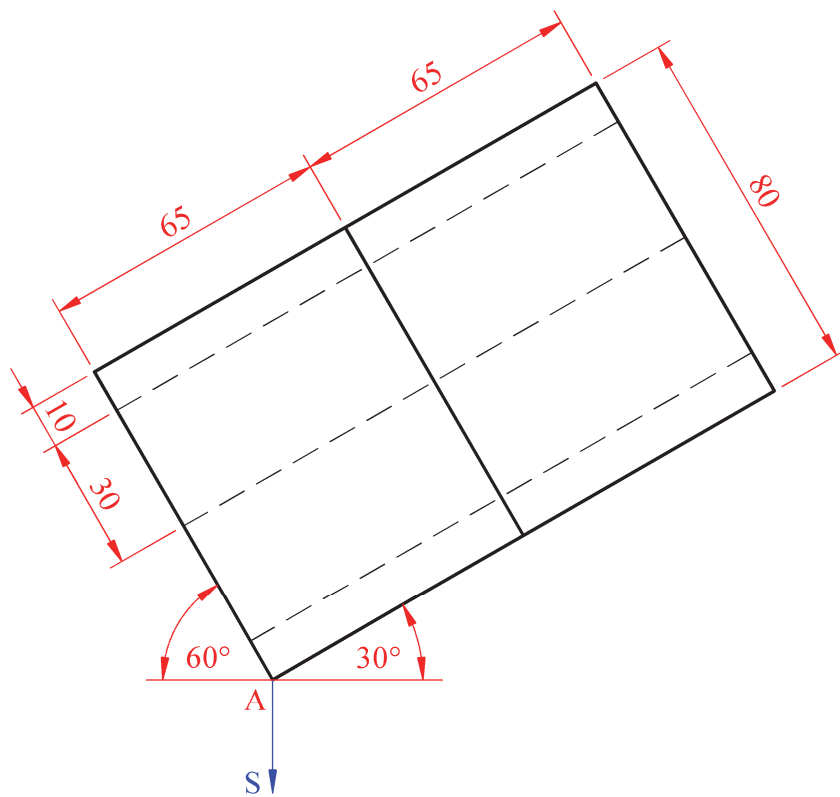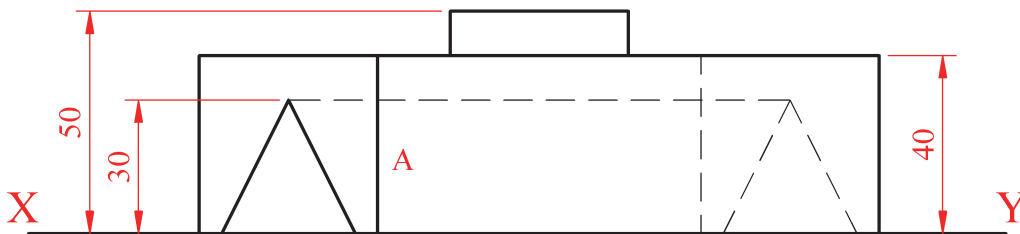
(a) Draw the given plan.

(b) Make a perspective drawing of the structure given the following:

- The spectator point is 70mm from corner **A**
- The picture plane is touching corner **A**
- The horizon line is 80mm above the ground line.
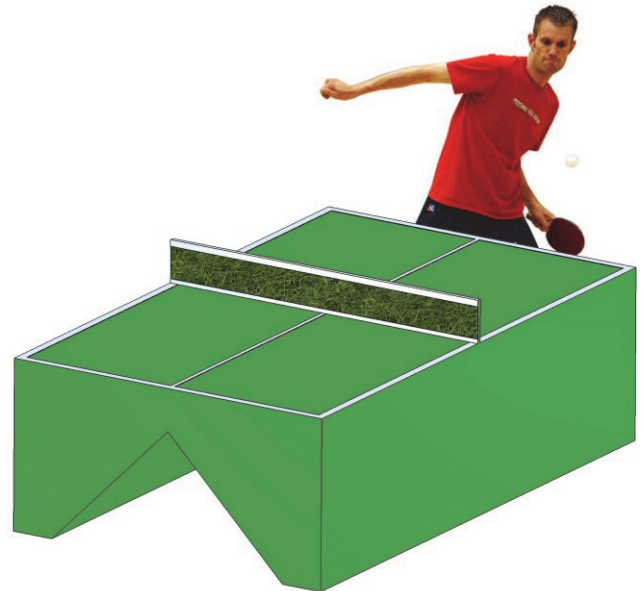
Scale 1:1

Fig. B-2

B-3. The 3D graphic on the right shows an MP3 player docking station.

Fig. B-3 below shows an isometric view of the device.

(a) Draw an elevation of the device looking in the direction of the arrow.

*(**Note:** Only the docking station needs to be drawn. The MP3 player, shown in the 3D graphic should be ignored.)*

(b) Draw a plan projected from the elevation.

(c) Draw an auxiliary elevation of the ***device***, projected from the plan, which will include the true shape of surface **A**.
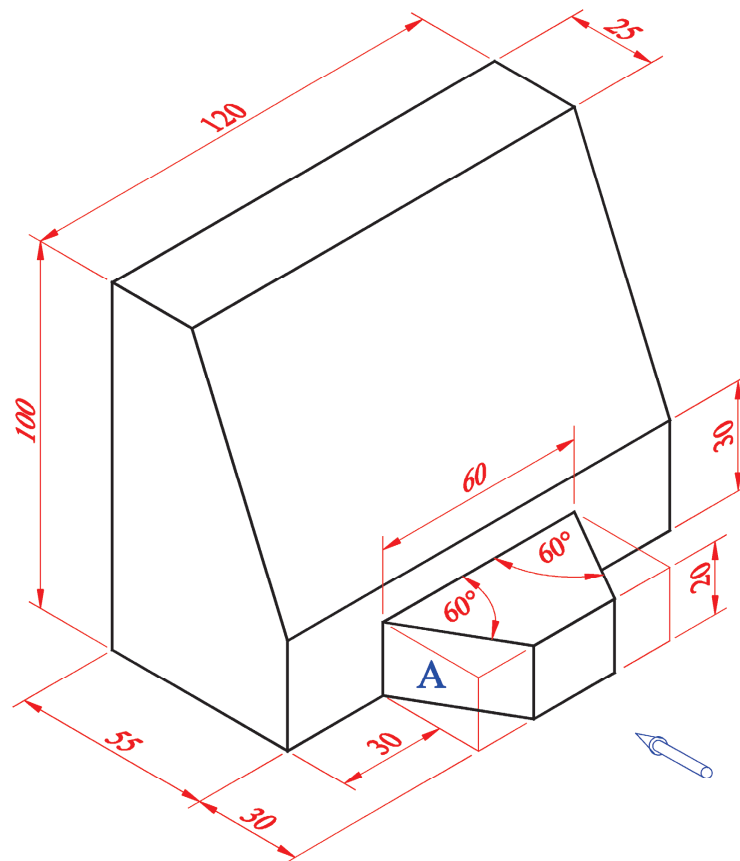
Scale 1:1

Fig. B-3

SECTION C - Applied Graphics
Answer **Any Two** questions (i.e. the options you have studied)
from this section on drawing paper

Geologic Geometry

C-1. The accompanying map, located on the back page of Section A, shows ground contours at five metre vertical intervals.

(a) On the drawing supplied, draw a vertical section (profile) on the line **AB**.

(b) It is proposed to use the valley at V as a reservoir for the generation of hydro-electricity. Draw a line on the profile to indicate the maximum depth of water this valley will hold.

(c) **CD** is the centreline of a proposed roadway which is level at an altitude of 75m.

Using side slopes of 1 in 1 for the embankments, complete the earthworks on the northern side, that are necessary to accommodate the roadway.

(Note: The earthworks on the southern side of the roadway have already been completed.)

Scale 1:1000

Structural Forms

C-2. The 3-D graphic on the right shows an Irish hotel with a modern roof structure.

Hyperbolic paraboloid surfaces are often used in structures such as this.

Fig. C-2 below shows the plan and elevation of a typical hyperbolic paraboloid surface **ABCD**.

(a) Draw the given plan and elevation of the hyperbolic paraboloid surface.

(b) Project an end view of the hyperbolic paraboloid surface.
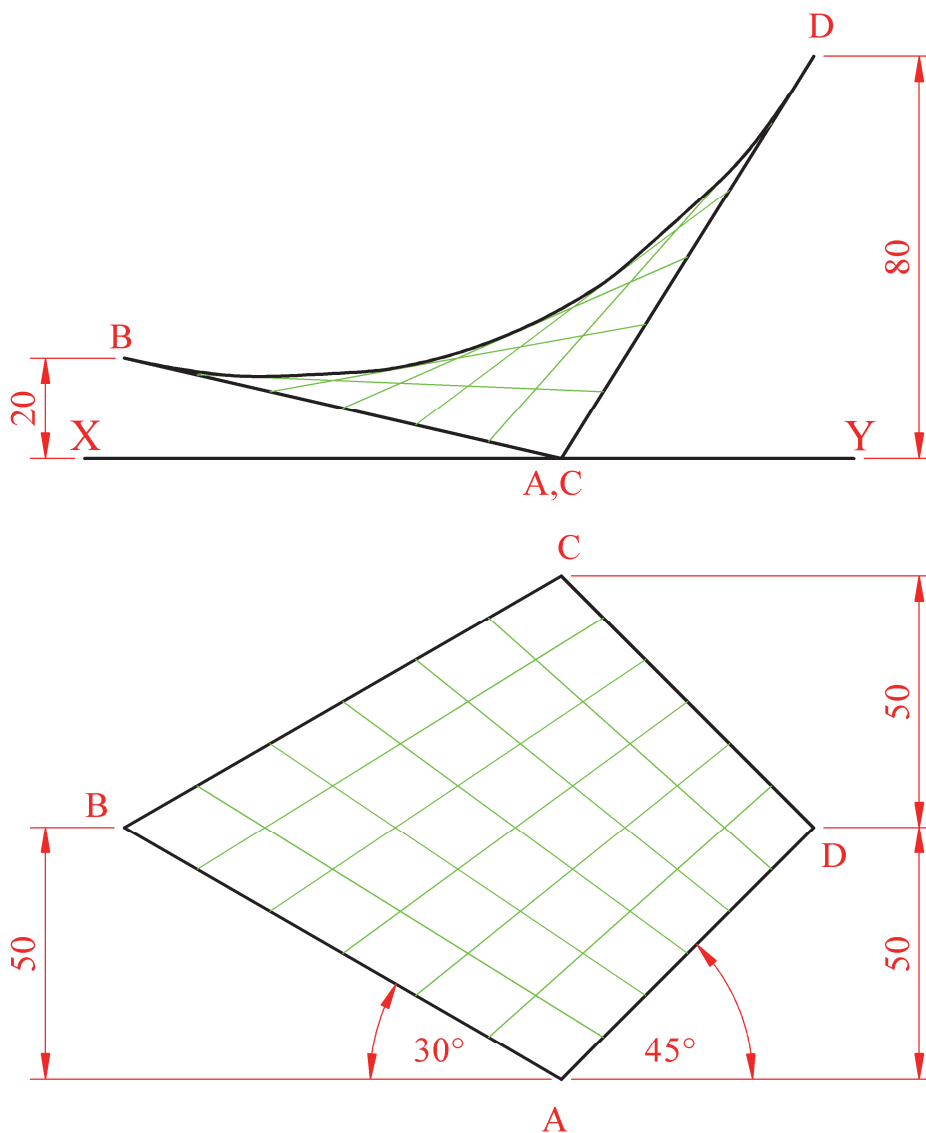
Scale 1:1

Fig. C-2

Surface Geometry

C-3. The 3D graphic on the right shows a design for a sweet box.

The plan and elevation of the box are shown in Fig. C-3 below.

(a) Draw the given views.

(b) Draw a one-piece surface development of the box.

(The 3D graphic shows text and a clear window opening, which should be ignored for the purpose of your drawing.)
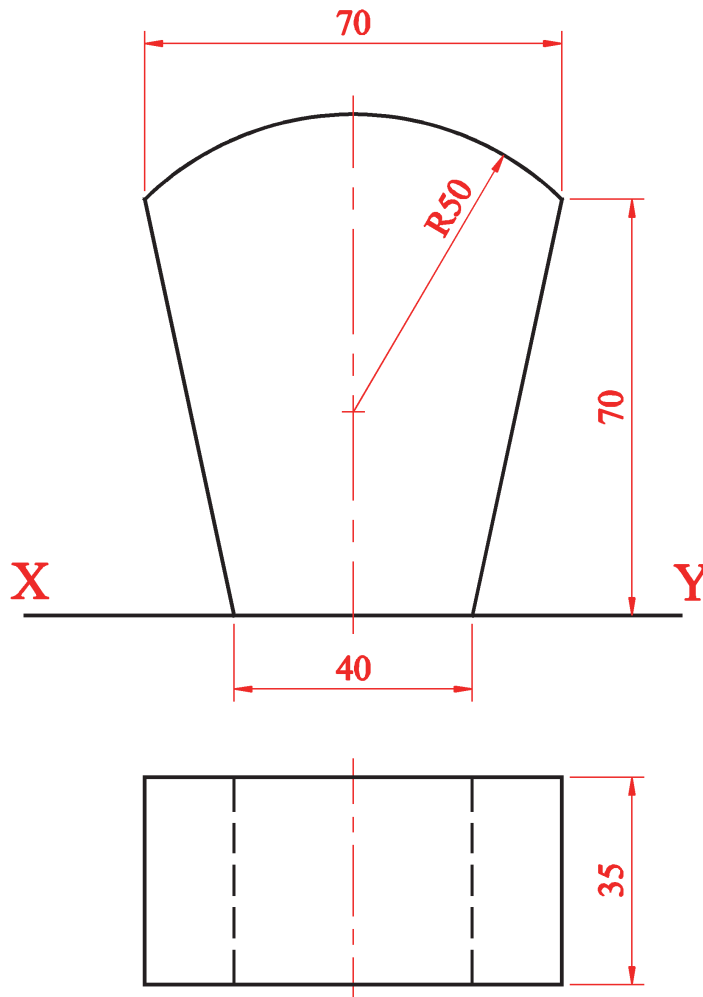
Scale 1:1

Fig. C-3

Dynamic Mechanisms

C-4. **(a)** The graphic on the right shows a cam which forms part of a quick release mechanism for a bicycle wheel.

A similar cam imparts this motion to a follower:

- 0° to 90° Rise 60mm with uniform velocity
- 90° to 180° Dwell
- 180° to 360° Fall 60mm with simple harmonic motion.

Draw the displacement diagram.

Note: *It is not necessary to draw the profile of the cam.*

Scale 1:1

(b) The graphic on the left below shows a waterslide which is in the form of a helix.

Fig C-4 on the right shows the plan and elevation of a partially completed helix.

The helix moves from point **A** at the bottom of the cylinder, to point **B** at the top of the cylinder, in one revolution.

Draw the given plan and elevation of the cylinder and complete the remainder of the helix.
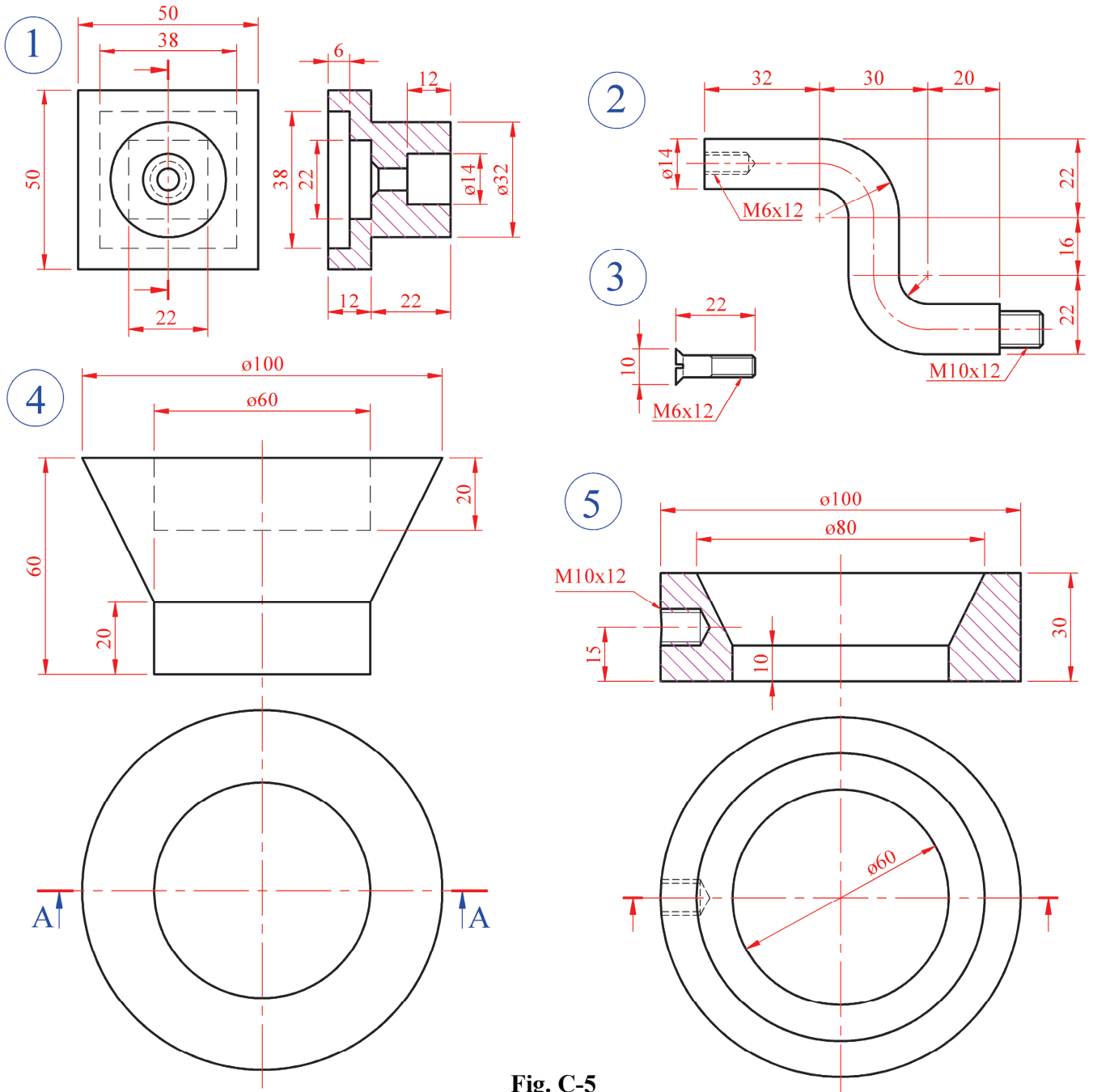
Scale 1:1
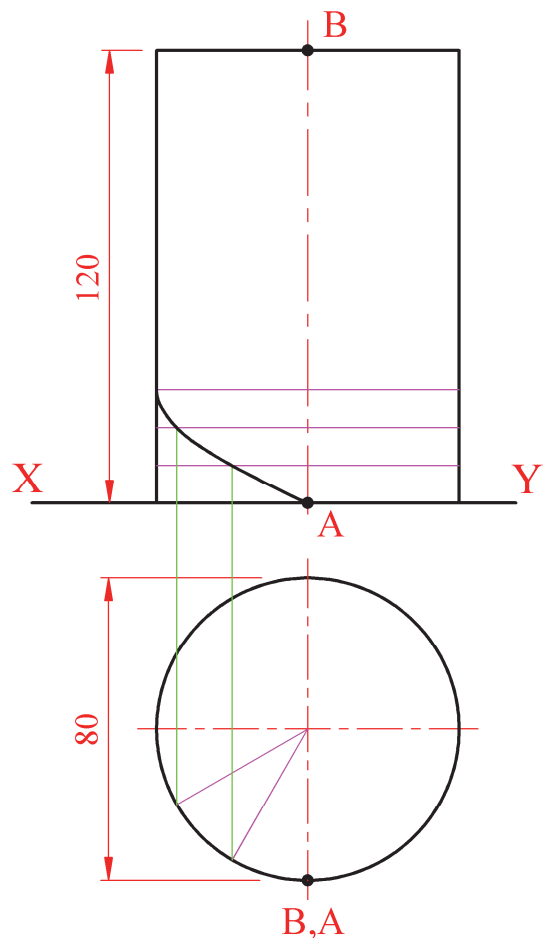
Fig. C-4

Assemblies

C-5. Details of a Soap Holder are given in Fig. C-5 with the parts list tabulated below. A 3D graphic of the individual parts is also shown.

Note: Some of the parts have been shown when sectioned by plane A-A.

Draw the **sectional elevation** A-A of the assembled Soap Holder.

(Any omitted dimensions may be estimated.)

Scale 1:1

Fig. C-5

Part	Name	Qty.
1	Wall Mount	1
2	Stem	1
3	Countersunk Screw	1
4	Soap Dish	1
5	Dish Support	1

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