Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2009

Design & Communication Graphics
Ordinary Level
Section A *(60 Marks)*

Friday, 12 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 A3 sheet overleaf
- All questions in Section A carry **20 marks**

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

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**


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 below and on all other sheets used*

Examination Number:

A-1. The 3D graphic below shows a typical satellite dish which is in the shape of a parabola.

On the drawing on the right draw the outline of the parabola in the rectangle ABCD. The vertex of the parabola should be positioned at V.
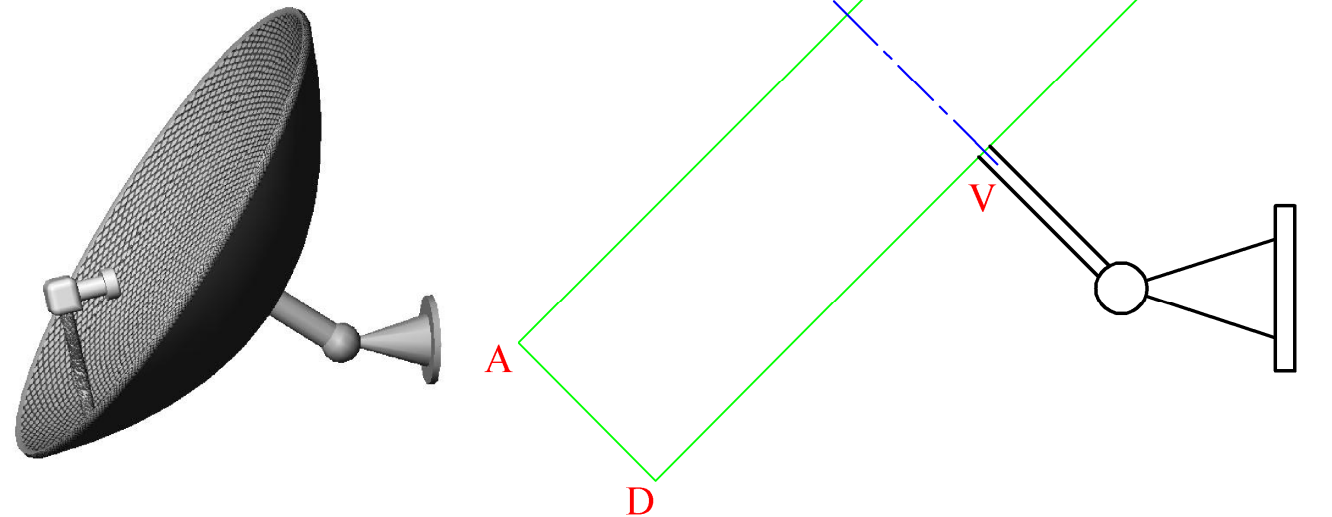
A-3. The 3D Graphic below shows a trophy consisting of a shaped glass pyramid on a marble base.

The projections of the glass portion are shown on the right.

The pyramid is cut by the oblique plane VTH as shown.

(a) Complete the elevation.

(b) Draw the true shape of the cut surface of the pyramid.
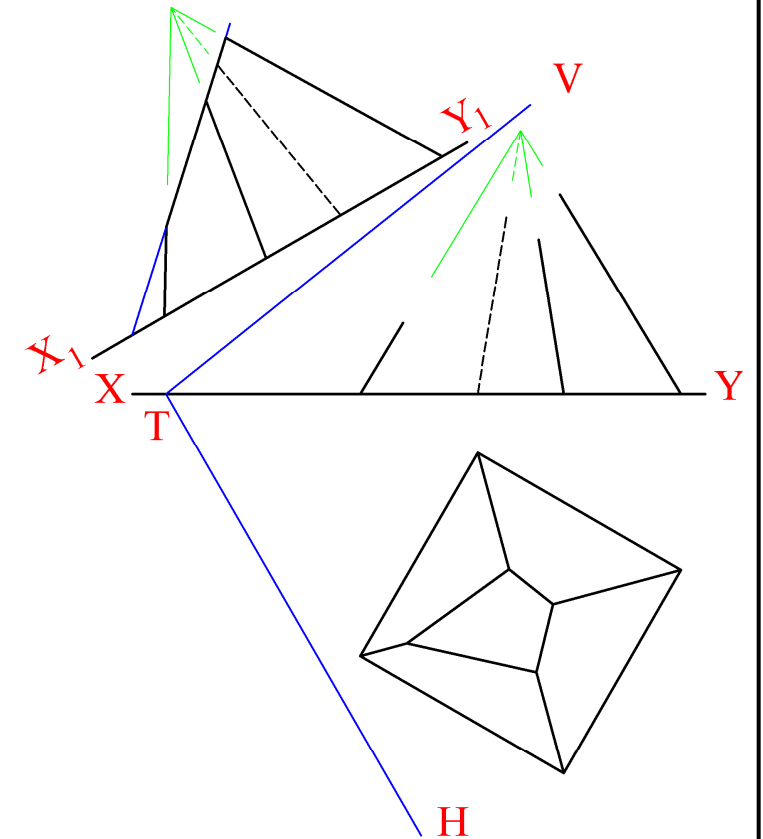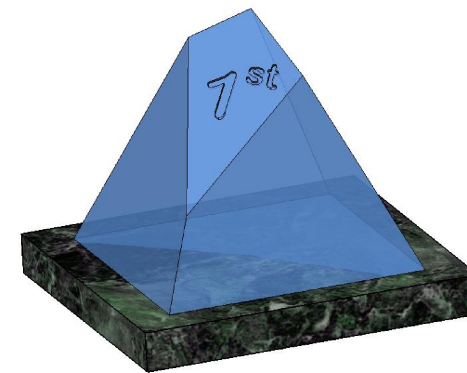
A-2. The plan and elevation of a garden seat are shown below. A 3D graphic is also given.

A set of isometric axes is shown on the right and the elevation of the object has been positioned relative to the axes as shown.
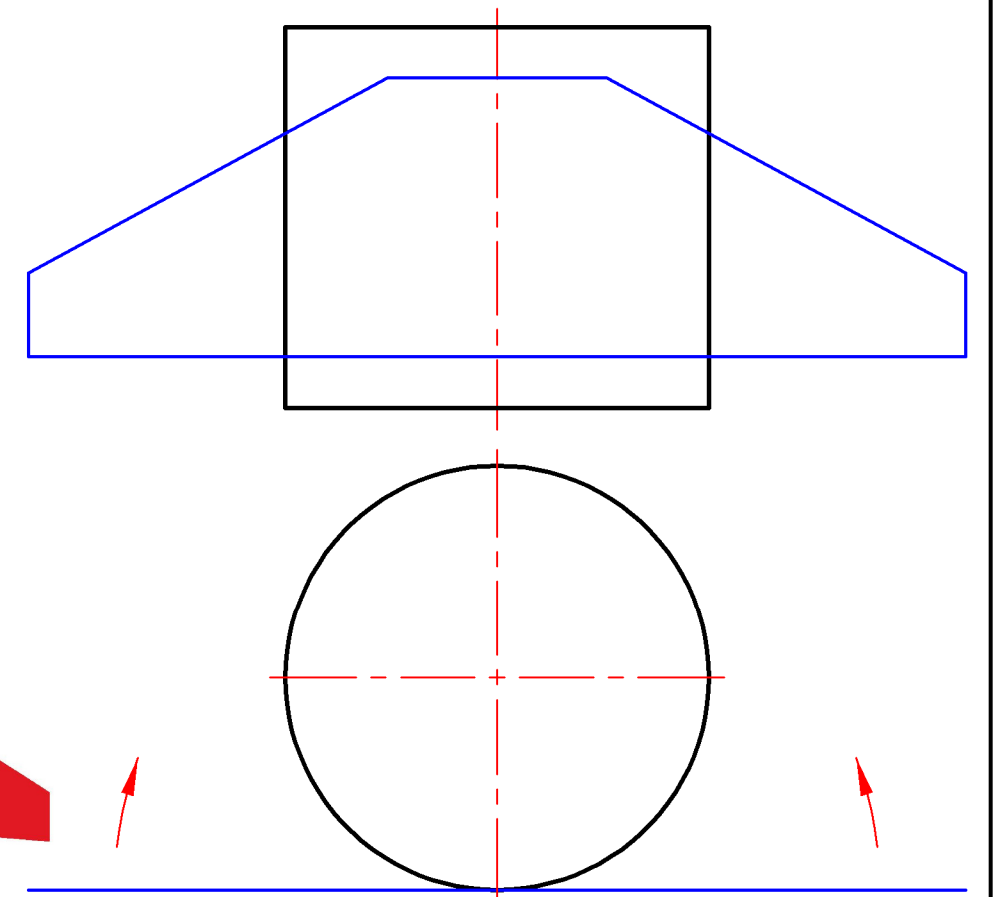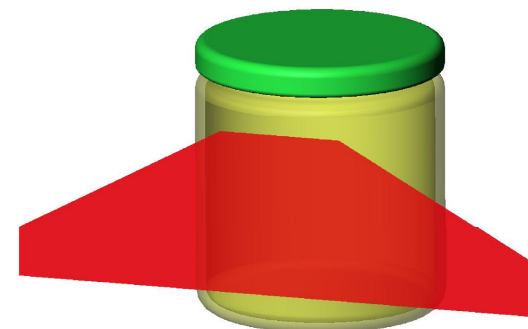
Draw the plan in its correct position and complete the axonometric projection.
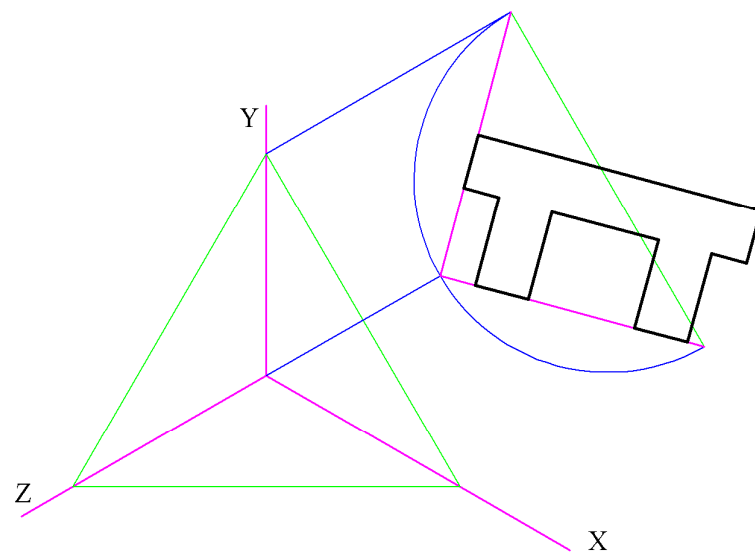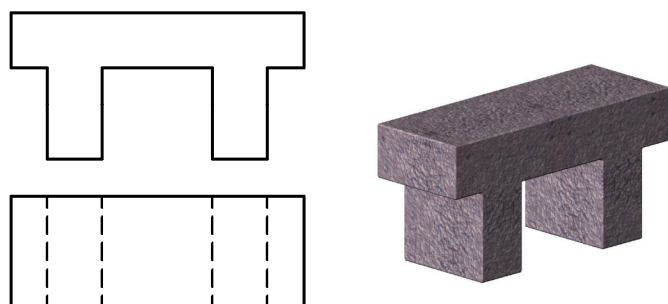
A-4. The 3D graphic below shows a glass jar and a label which is to be wrapped around it.

The drawing on the right shows the plan and elevation of the label and the cylindrical portion of the glass jar.

Complete the elevation showing the label in the wrapped position.

This Contour Map is part of Section C
and should only be used for the
answering of the Geologic Geometry
Option (Question C-1)
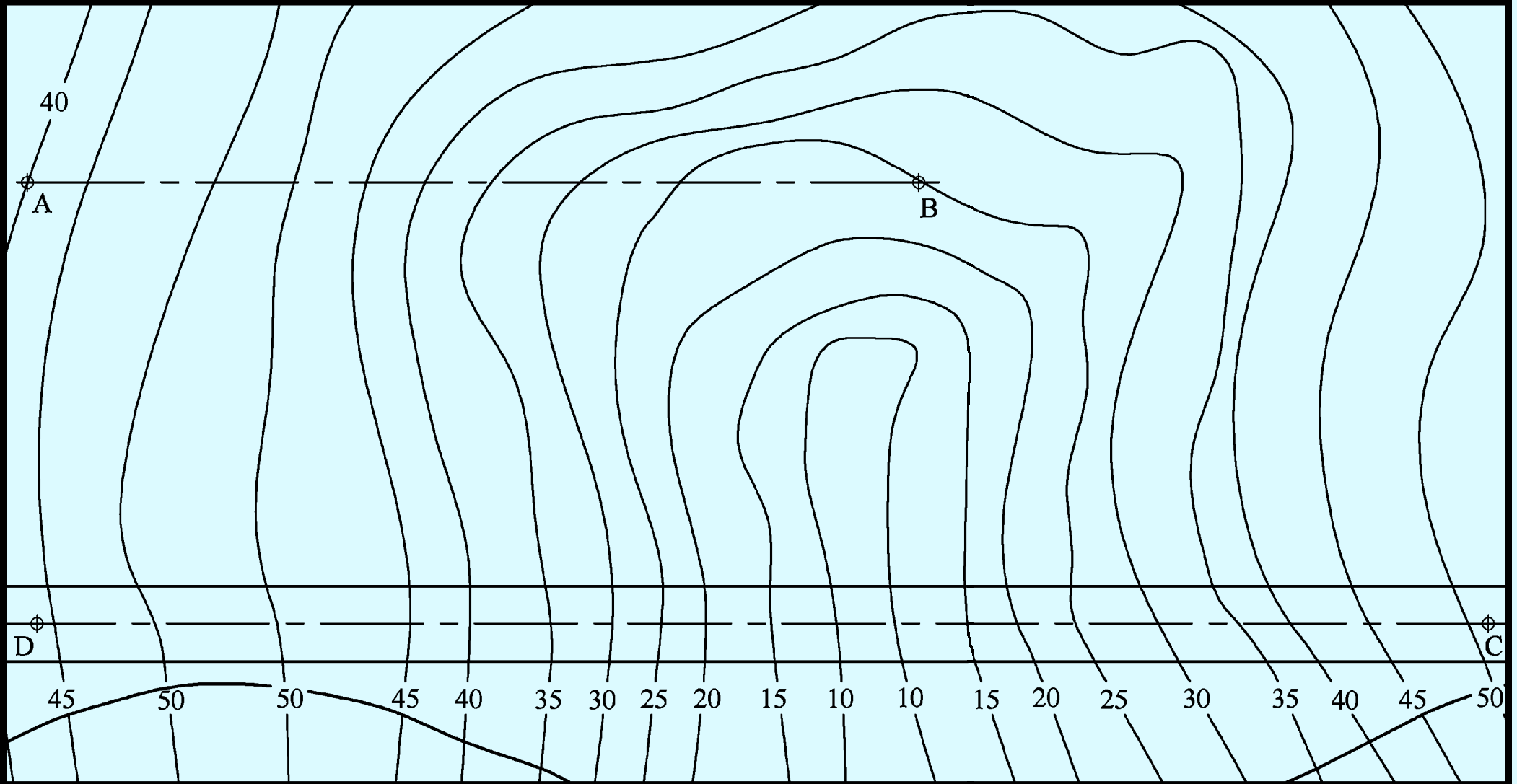
40

A

B

D

C

45   50   50   45   40   35   30   25   20   15   10   10   15   20   25   30   35   40   45   50

Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2009

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

Friday, 12 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**

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

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**

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 shows an entrance to a house. The drawing in Fig. B-1 below shows the right hand pier and wall from the entrance.

(a) Draw the given plan and elevation.

(b) Draw an auxiliary elevation of the pier and wall, projected from the plan, which will show the true shape of surface A of the wall.
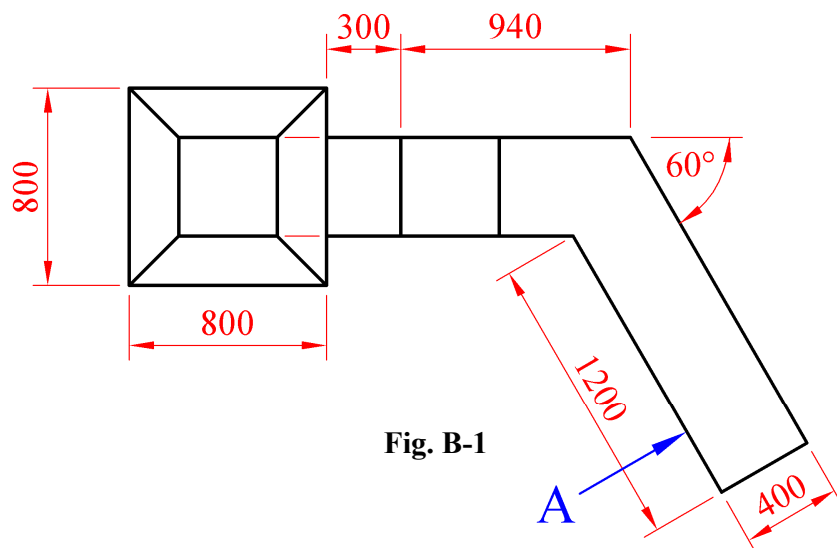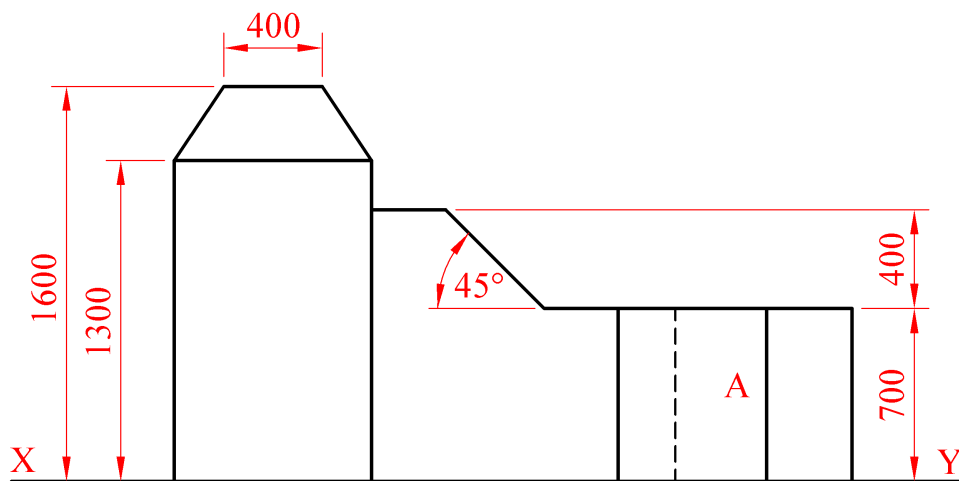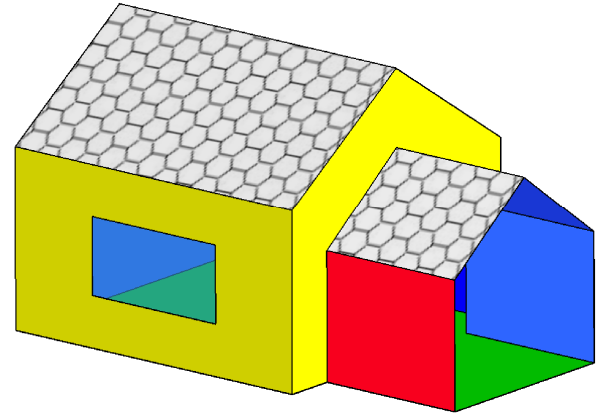
Scale 1:20

Fig. B-1

B-2. The 3D graphic on the right shows a child's playhouse which is made from plastic.

Fig. B-2 below shows the plan and elevation of the structure.

(a) Draw the given plan.

(b) Make a perspective drawing of the structure given the following:
- The spectator point is 1440mm from corner A;
- The picture plane is touching corner A;
- The horizon line is 1000mm above the ground line.
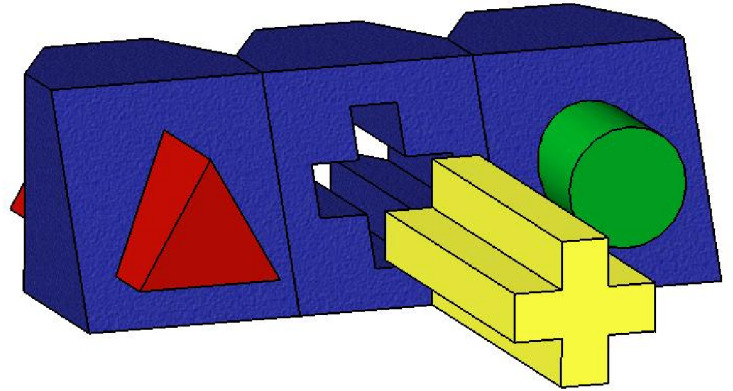
Scale 1:20
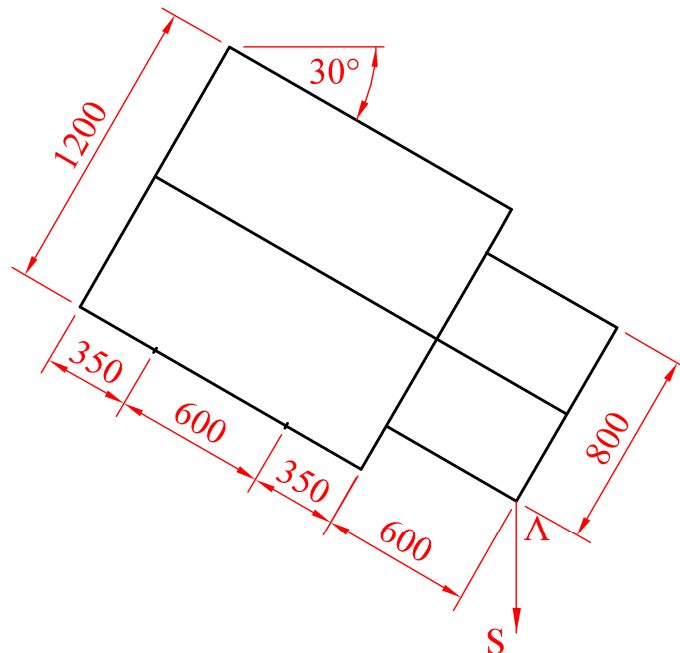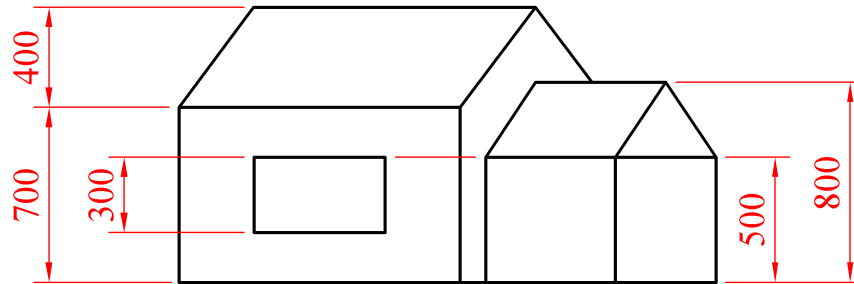
Fig. B-2

B-3. The 3D graphic on the right shows a child's toy.

Fig. B-3 below shows one of the blocks and one of the pegs from the toy.
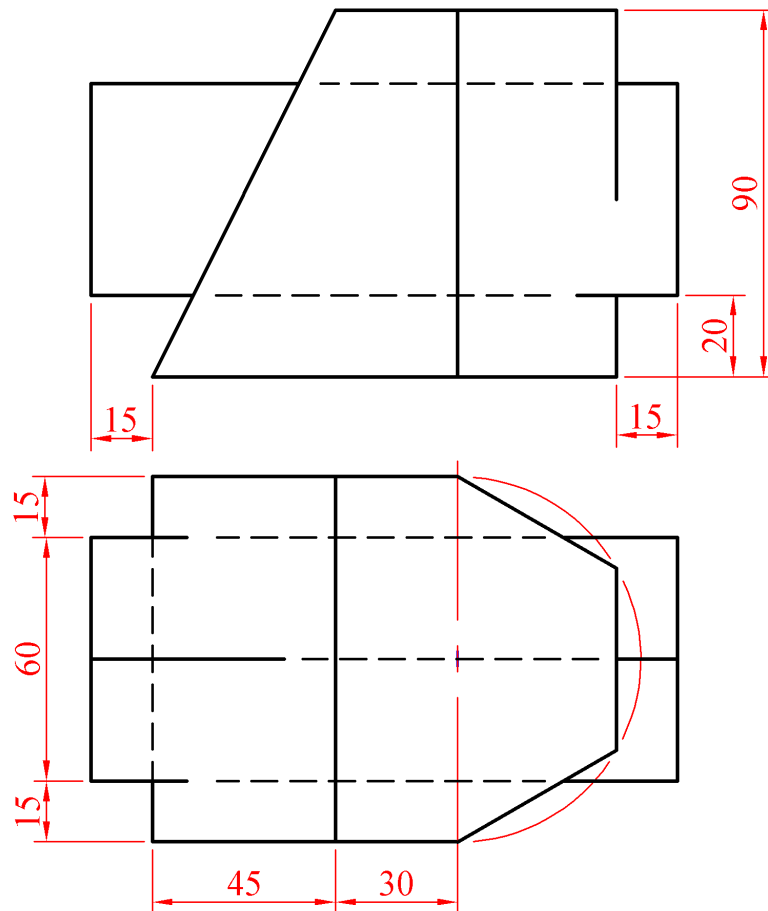
The peg is an equilateral triangular prism, of 60mm side.

Draw the given plan and elevation and project an end elevation of the block and peg.

Show all lines of interpenetration.

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) An observation tower is to be built at A. Determine the minimum height for the tower if the ground at B is to be visible from the top of the tower.

(c) CD is the centreline of a proposed roadway which is level at an altitude of 55m.

Using side slopes of 1 in 1 for the embankments, complete the earthworks 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. A modern exhibition centre which has a triangular glass front and a triangular glass doorway is shown in the 3D graphic on the right.

Fig. C-2 below shows the plan and elevation of the structure.

(a) Surface ABCD of the structure is in the form of a hyperbolic paraboloid.

Draw the given plan and elevation of the hyperbolic paraboloid surface and project an end view.

(b) Draw the elevation, end view and plan of the triangular entrance and complete the projections of the structure.
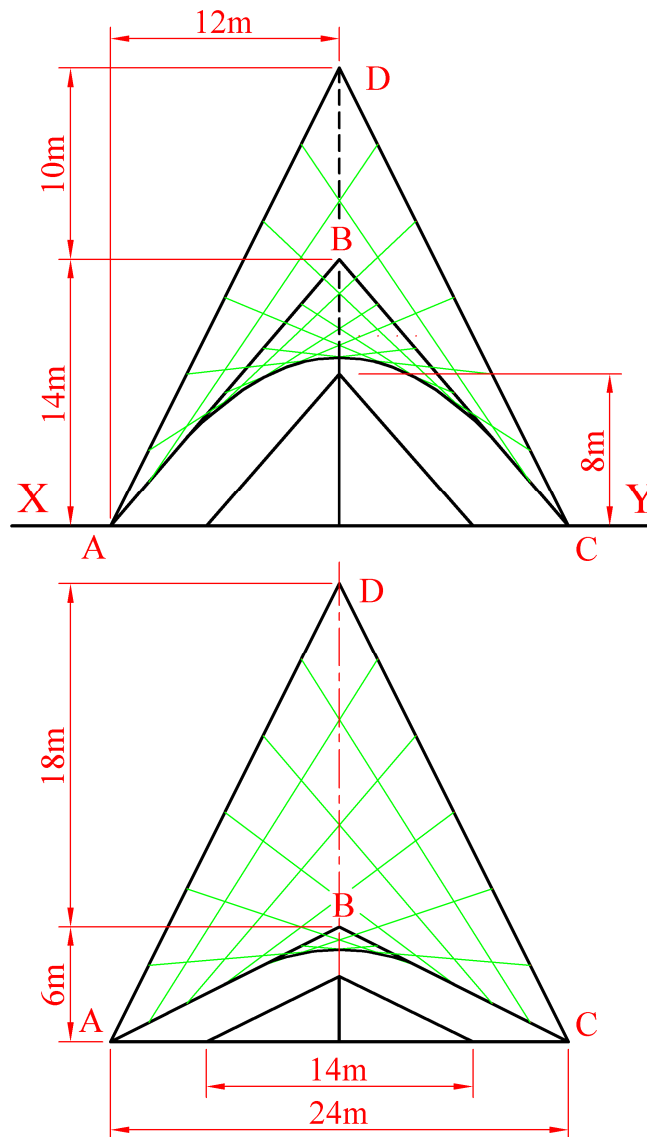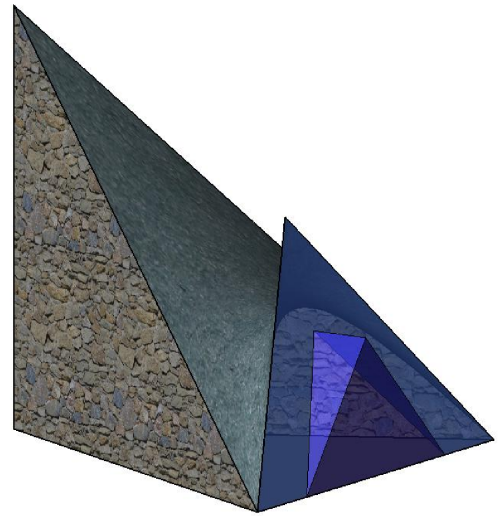
Scale 1:200

Fig. C-2

Surface Geometry

C-3. The 3D graphic on the right shows a recycling bin made from stainless steel. The plan and elevation of the bin are shown in Fig. C-3 below.

    (a) Draw the given plan and elevation.

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

    (c) Draw and indicate, in millimetres, the minimum size of a rectangular sheet which would contain the development.
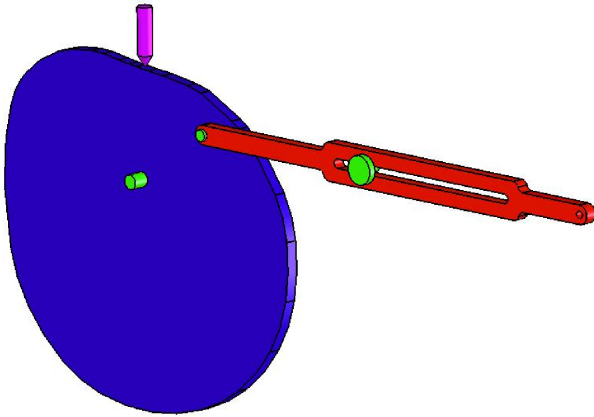
Scale 1:10

600

1000

300

Ø400

300
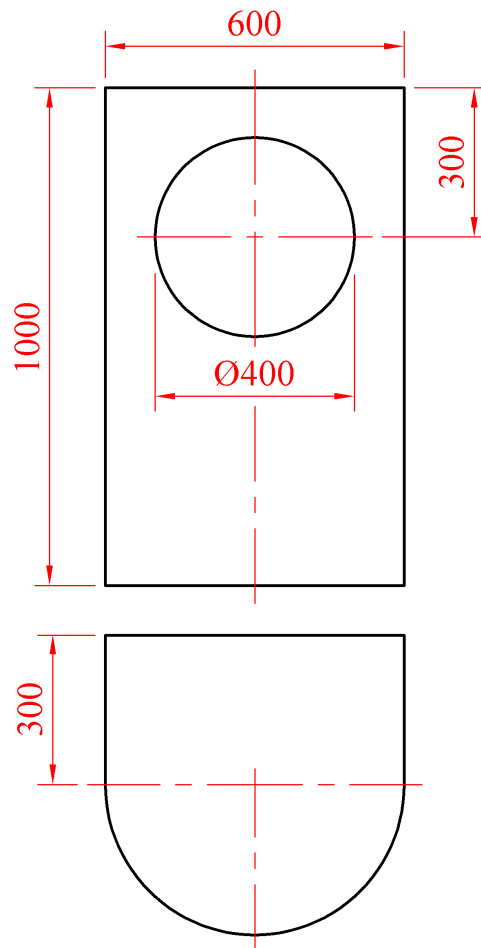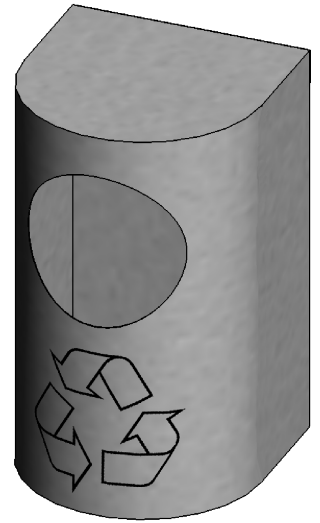
Fig. C-3

Dynamic Mechanisms

C-4. The 3D graphic below shows a model of a mechanism from the pull along toy camel on the right.

The rotating cam causes the rider to move up and down and the link mechanism moves the toy's head in a slow "camel like" movement.

The cam and link mechanism are both shown in Fig. C-4 below.

(a) Draw the displacement diagram for the cam given that it imparts the following motion to the follower:
- A to B   (0° to 90°)   Rise with uniform acceleration and retardation;
- B to C   (90° to 150°)   Rise with uniform velocity;
- C to D   (150° to 180°)   Dwell;
- D to A   (180° to 360°)   Fall with simple harmonic motion.

Note: It is not necessary to draw the outline of the cam. Only the displacement diagram is required.

(b) The link EF is pin jointed to the cam at E and the link slides through the fixed point P. On a separate diagram, draw the link mechanism as a line diagram. Plot the locus of point F for one revolution of the cam about the fixed point O.

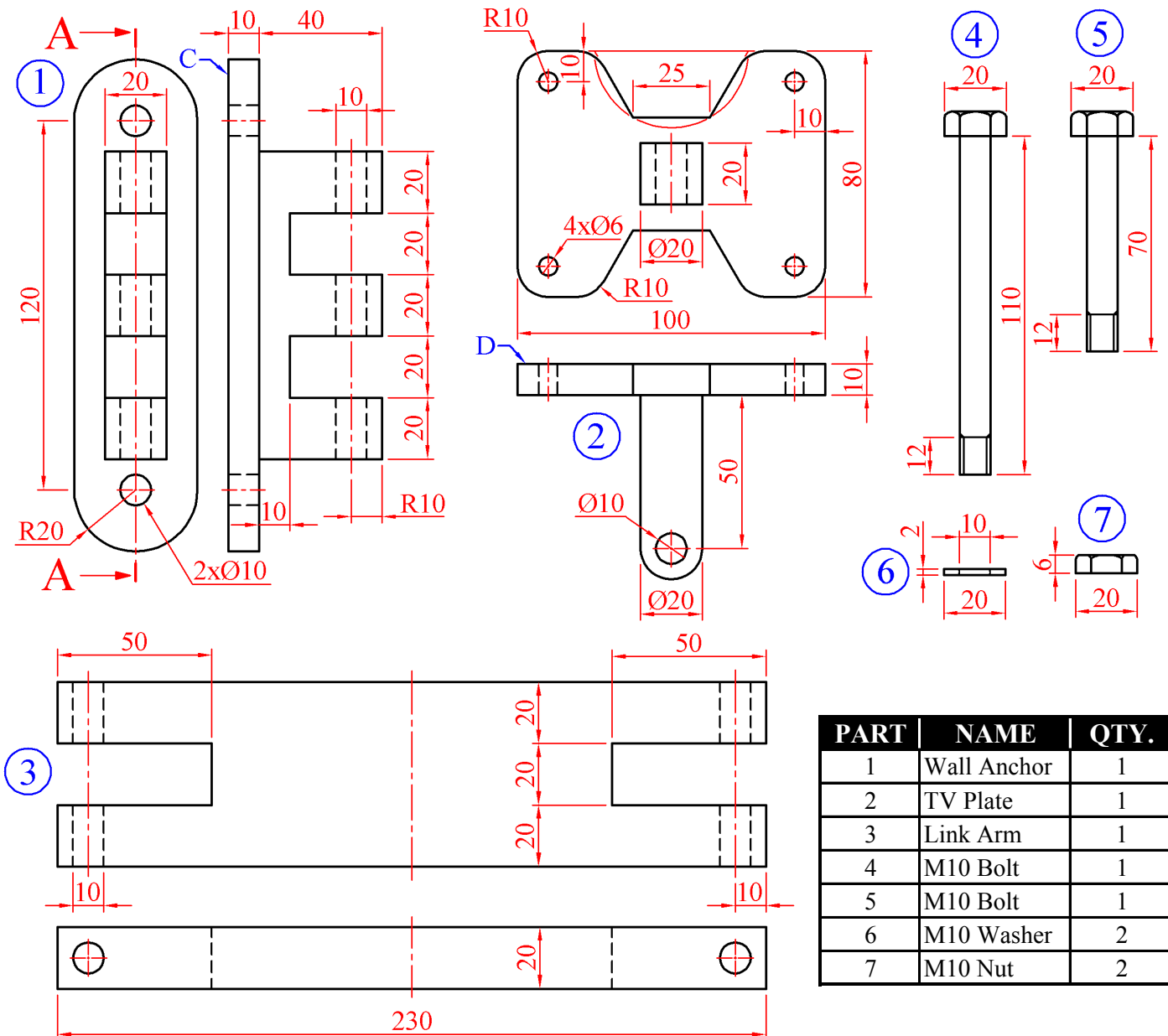*Note: It is not necessary to draw the outline of the cam.*

Scale 1:1
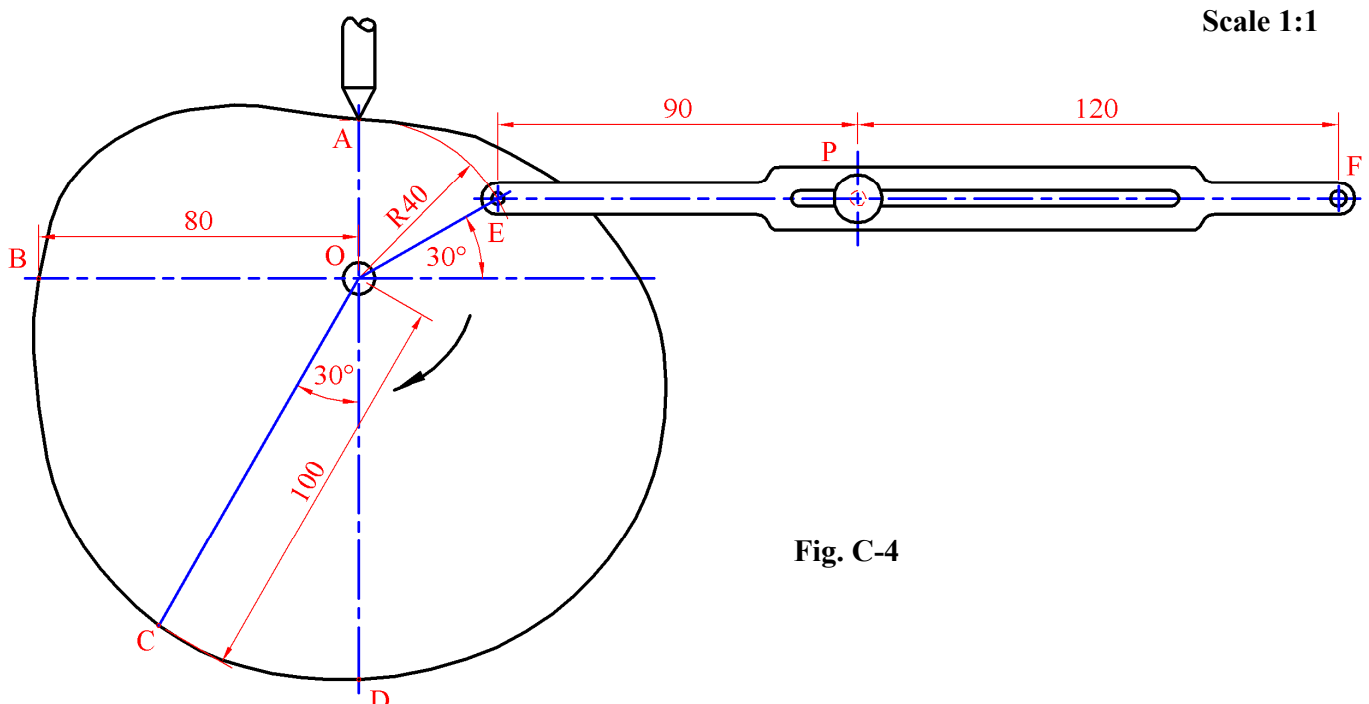
Fig. C-4

C-5. The 3D graphic on the right shows an LCD TV which is attached to a wall with a movable support bracket. Details of the support bracket are given in Fig. C-5 with the parts list tabulated below.

(i) Draw the sectional elevation A-A of the assembled parts when the bracket is in the fully extended position.
(Any omitted dimensions may be estimated.)

(ii) On a separate drawing, determine the distance between the wall (surface C) and the back of the TV (surface D) when the bracket is fully closed and the TV is parallel to the wall.

Scale 1:1

PART	NAME	QTY.
1	Wall Anchor	1
2	TV Plate	1
3	Link Arm	1
4	M10 Bolt	1
5	M10 Bolt	1
6	M10 Washer	2
7	M10 Nut	2

Fig. C-5

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