



Leaving Certificate Examination, 2011

Design & Communication Graphics
Higher Level

Section A (60 marks)

Friday, 17 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** 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 below and on all other sheets used.*

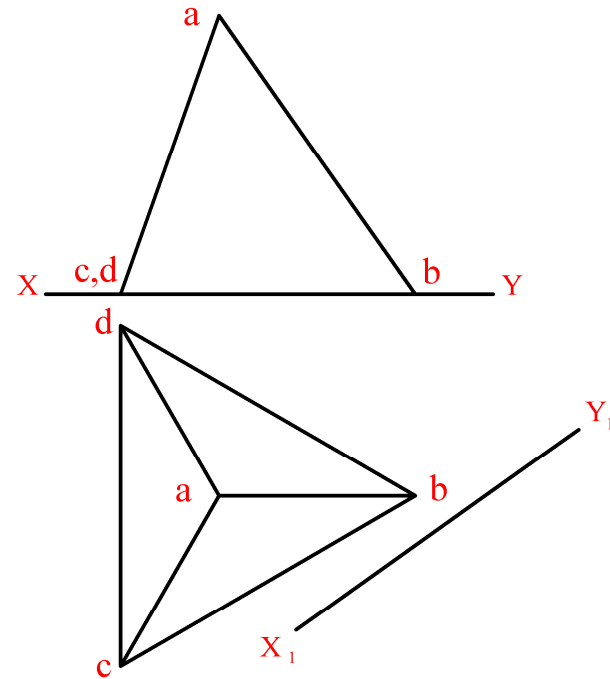
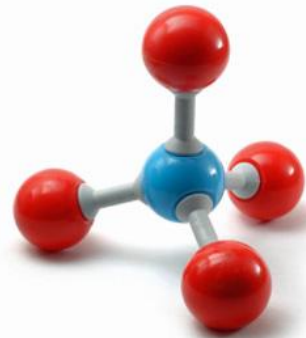
Examination Number:

SECTION A - Core - Answer Any Three of the questions on this A3 sheet

A-1. The 3D graphic below shows a molecule of methane. The four outer atoms, shown in red, are located at the vertices of a tetrahedron.

The drawing on the right shows the projections of a regular tetrahedron (*without the spheres*).

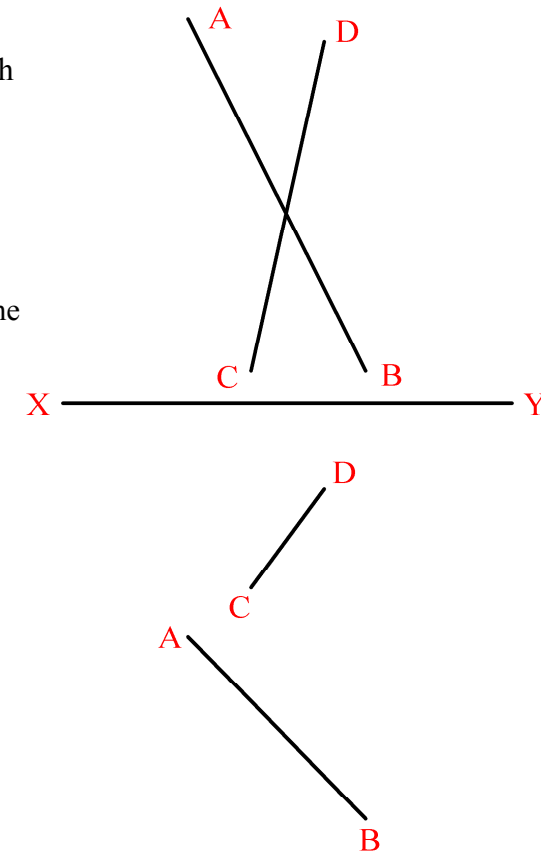
- (a) Draw an auxiliary plan, on the given X_1Y_1 line, to show the dihedral angle between the planes abc and abd .
- (b) Draw the projections of the largest possible sphere that can be contained inside the tetrahedron.



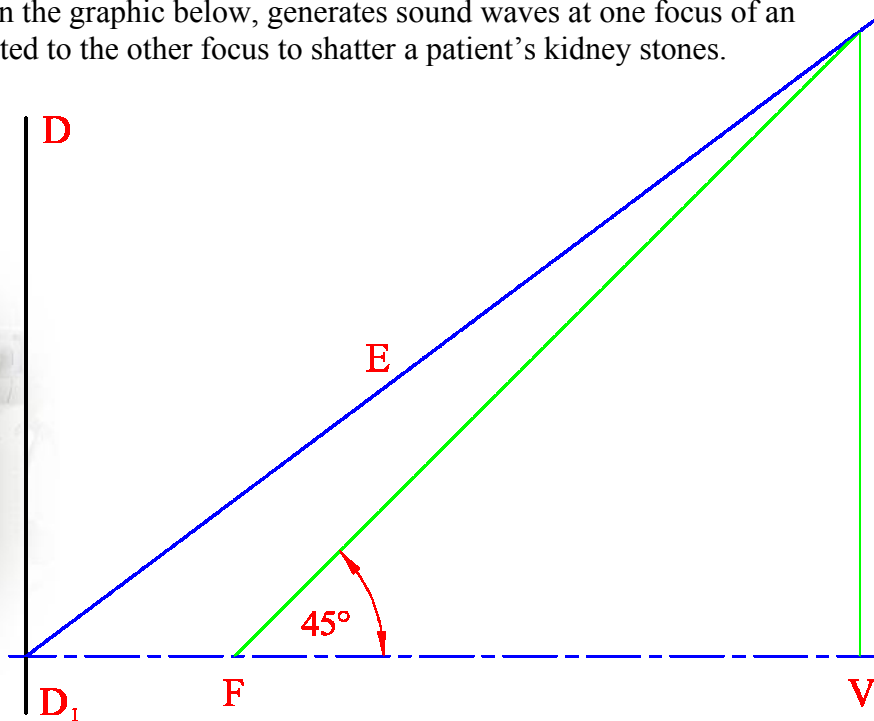
A-3. The graphic below shows a number of sloping arms which support lights in a modern sculpture.

Two such arms are represented by the skew lines AB and CD on the right.

Determine the projections of the shortest horizontal distance between the two lines.



A-2. A bio-medical device, as shown in the graphic below, generates sound waves at one focus of an ellipse. The waves are then reflected to the other focus to shatter a patient's kidney stones.



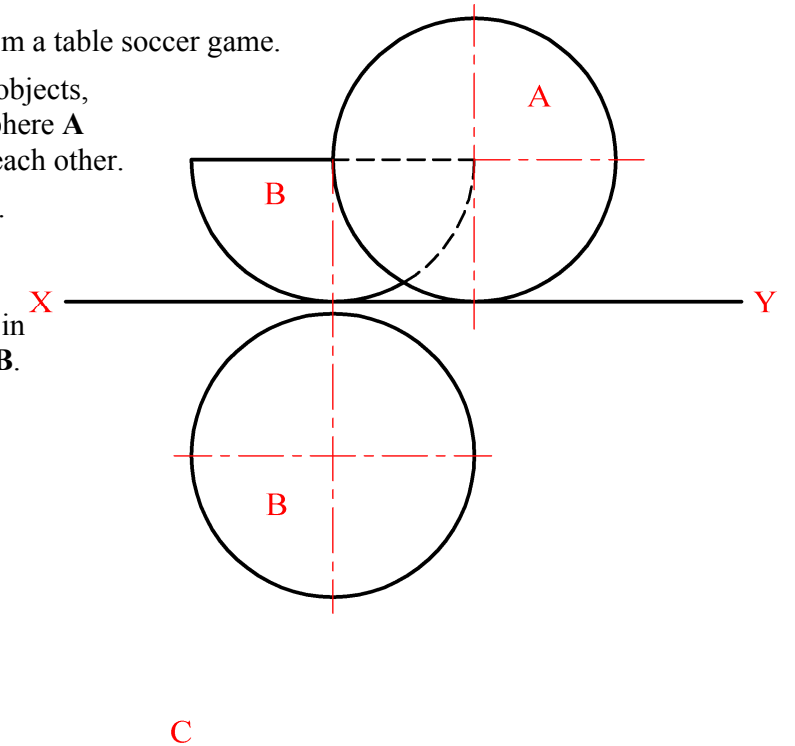
The drawing on the right shows the directrix (DD_1), focus (F), vertex (V) and eccentricity line (E) of an ellipse.

- (a) Locate the second vertex and the second focus and draw the top half of the curve.
- (b) Draw a tangent at a point on the curve which is 70mm from F .

A-4. The graphic below shows a figure and a ball from a table soccer game.

The drawing on the right, which represents the objects, shows the elevation and incomplete plan of a sphere A and a hemisphere B , which are in contact with each other.

- (a) Complete the plan of both solids in contact.
- (b) Draw the plan of another sphere, of diameter 20mm, which rests on the horizontal plane, in position C , so that it is in contact with the sphere A and hemisphere B .



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

