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)

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

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

- Five questions are presented.
- **SECTION C** 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.

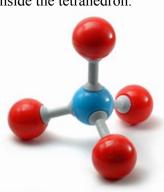
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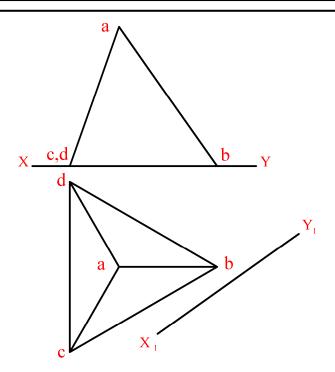
SECTION A - Core - Answer **Any Three** of the questions on this A3 sheet

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.



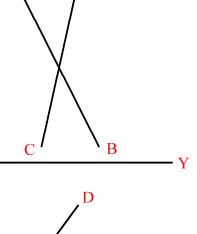


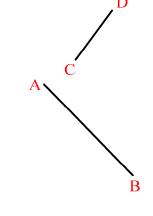
A-3. The graphic below shows a number of sloping arms which support lights in a modern sculpture.

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.

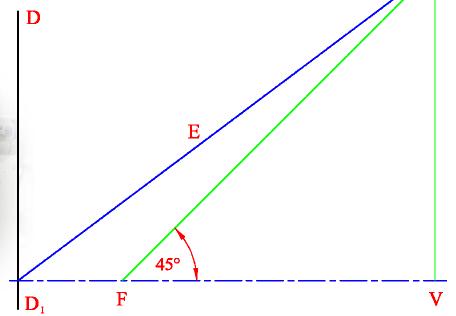






A-2. A bio-medical device, as shown in the graphic below, generates sound waves at one focus of an ellipse. The waves are then reflected to the other focus to shatter a patient's kidney stones.

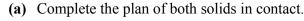




The drawing on the right shows the directrix $(\mathbf{DD_1})$, focus (\mathbf{F}) , vertex (\mathbf{V}) and eccentricity line (\mathbf{E}) of an ellipse.

- (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.



(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.



