

200 Marks - 180 minutes - First Angle Orthographic Projection

Question 1 - Civil Analytical - Site Plan: ± 30 Marks ± 27 Minutes

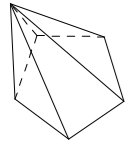
- Know the abbreviations used on a Site Plan and other Civil Drawings: MH, BL, IE, RE, ST, VP, G, IC, BIC, etc.
- Determining distances on a Site Plan in metre or in millimetres.
- Know the different colours used on Site Plans, Elevations and Drainage Plans that represent the types of work(material) to be conducted, including identification of different building materials used.
- Remember that corner heights are given in metres. Ensure that you understand what Contour Lines are and how to determine different heights on a given Site Plan.
- Read the questions thoroughly. If the question states that the answer must be in metre, give the answer in metre. The same applies to questions asked in millimetres.
- Remember that Graphical Symbols (B, WC, SH, WB, S, WT, U, etc.) must be represented without any deviation from SANS codes.
- If you are asked to draw a Graphical Symbol, remember to draw the views in First Angle Orthographic Projection.
- Do not leave any questions blank. The answers can be found or determined by referring to the Title Panel or the given Site Plan.
- You will be required to calculate Area and Perimeter. Always indicate the calculations and formula used. Remember that the Area of a Triangle = $\frac{1}{2} b \times h$ (Always add the unit i.e. m² for Area and m for Perimeter).
- Convert the given dimensions to metres before doing the calculations.
- Remember that the Stand Number is allocated on the Stand.
- Identification of a Water meter, Electrical meter, Water storage tanks, Work to be demolished, Ramps, Steps, etc. on a Site Plan.
- Ensure that you can identify and draw the North Point and determine orientation towards N, E, S, W.
- Know all the labels of building features/materials used to represent the Foundation to the Roof Cap of a Civil Section!



Question 2 - Solid Geometry and/or Interpenetration and Developments: ± 40 Marks ± 36 Minutes
(If you struggle with the content of Question 2, first complete Question 1, 3 and 4 of the question paper)

Solid Geometry:

- Conduct layout planning first for the views to be drawn in First Angle Orthographic Projection.
- Ensure that you distinguish between a Prism, Pyramid, Cone and a Cylinder.
- Ensure that you know what is referred to by 'Right Regular' Prisms and Pyramids.
- Always redraw the given views to scale to obtain the minimum marks for the question.
- Remember that hidden detail can be indicated behind hatched surfaces in Solid Geometry.
- Hatching should be at 45°, evenly spaced, similar to hatching of Mechanical parts.
- Remember to indicate Centre Lines where required.
- Allocate numbers and/or letters to label different points of a figure on different views.
- You will not be penalised for using numbers or letters on your drawing.
- Ensure that you can correctly rotate and project a given figure in First Angle Orthographic Projection.
- Focus on Pyramids and Prisms of Triangles, Squares, Rectangles, Pentagons, Hexagons, Octagons including Cones and Cylinders.
- Make sure you can identify and draw Auxiliary Views from the given Primary Views.
- Ensure that you can draw and determine the True Shape of a cut surface.
- Always indicate construction lines used.
- Only the curves of irregular arcs may be drawn in neat freehand, eg. the base of an inclined Cone or Cylinder.
- Only add hidden detail to your drawing if the question specifies it.

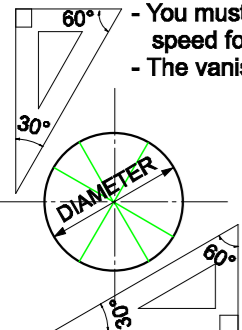


Interpenetration and Developments:

- Conduct layout planning first for the views to be drawn in First Angle Orthographic Projection.
- Determine which Primary Views and auxiliary views must be drawn first, don't just start to draw.
- Redraw the given views to scale to obtain the minimum marks for the question.
- Check if there is a seam and start your development from the seam.
- Ensure that you can identify and determine True Lengths on the different views.
- Hidden detail must be shown unless stated otherwise.
- Remember that calculating the circumference of a circle (cylinder) is $\pi \times \text{Diameter}$.
- Make sure you can correctly apply the construction method for line divisioning.

Question 3 - Two-Point Perspective: ± 40 Punkte ± 36 Minutes

- Read the question before you start to draw.
- Check the question to see if internal features should be presented.
- Determine if the top view of the Perspective question is at 45° or 30°/60° or 60°/30°.
- Ensure you can determine the Stationary Point (SP) if the vanishing points are given.
- Always label the vanishing points immediately after determining them (LVP, RVP).
- Circles and/or arches are always present, indicate circle/arch constructions used.
- You must practice Perspective drawings in order to improve your drawing speed for the Perspective question. The latter applies to all EGD drawings!
- The vanishing points are always present on the Horizon Line (HL).



EGD Support Sheet

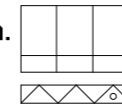


Previous NSC Examination Papers - EGD Only



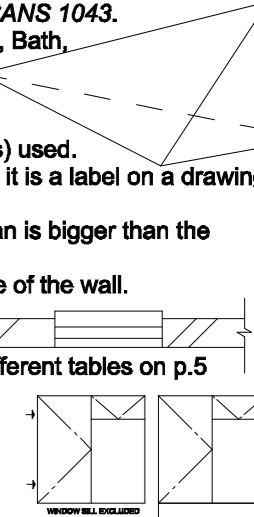
Floor Plan: ± 30 Marks ± 27 Minutes

- Read Question 4 thoroughly and plan your drawing layout before you start to draw, take enough time to review p.5.
- Determine which elevation must be drawn and identify the Civil Cutting Plane and the direction thereof.
- Electrical and Graphical Symbols must be drawn without any deviation with reference to the SANS 1043.
- You will be required to draw Graphical Symbols to scale i.e. Wash Basin, Urinal, Water Closet, Bath, Wash Tub, Shower, BIC, etc. on the given Floor Plan.
- You will not be asked to redraw the entire Floor Plan!
- Electrical Symbols may be drawn in neat freehand.
- Remember to always indicate the room designations and the Final Floor Layer (Floor Finishes) used.
- Room designations and floor finishes must be indicated in CAPITAL PRINTED lettering, since it is a label on a drawing.
- Leave hatching of the Floor Plan (45°) for last, it is time-consuming work for a few marks.
- Draw the windows correctly on the Floor Plan. The gap given for the windows on the Floor Plan is bigger than the actual size of the windows.
- The double line which represents the frame of the window must always be drawn in the middle of the wall.
- Use abbreviations to label Graphical Symbols, check the question to see if it is required.
- Ensure that you can correctly interpret the direction of the Civil Cutting Plane.
- You do not have to memorise the sizes of Civil Features, windows and doors. There will be different tables on p.5 specifying the sizes. Use an arrow to indicate the opening direction of sliding doors.



Incomplete Elevation: ± 25 Marks ± 22 Minutes

- The Elevation must be redrawn to the same scale as the Floor Plan, usually 1:50.
- You must project the necessary lengths/features from the Floor Plan to the elevation.
- Use the given information on p. 5 to complete the Elevation. Remember arrows for sliding windows and doors.
- Window frames and doors may be presented as a single line on the Elevation.
- Remember to indicate window sills if present as well as the hinged side and opening side of the windows.
- Always label the GL, FFL, and Title of the Elevation eg. WEST ELEVATION.
- Remember to indicate the lines for the roof cap, barge-boards and ridge covers on the roof.



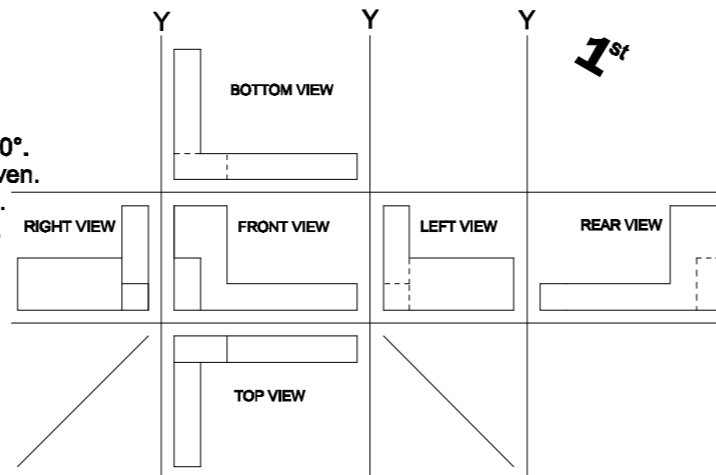
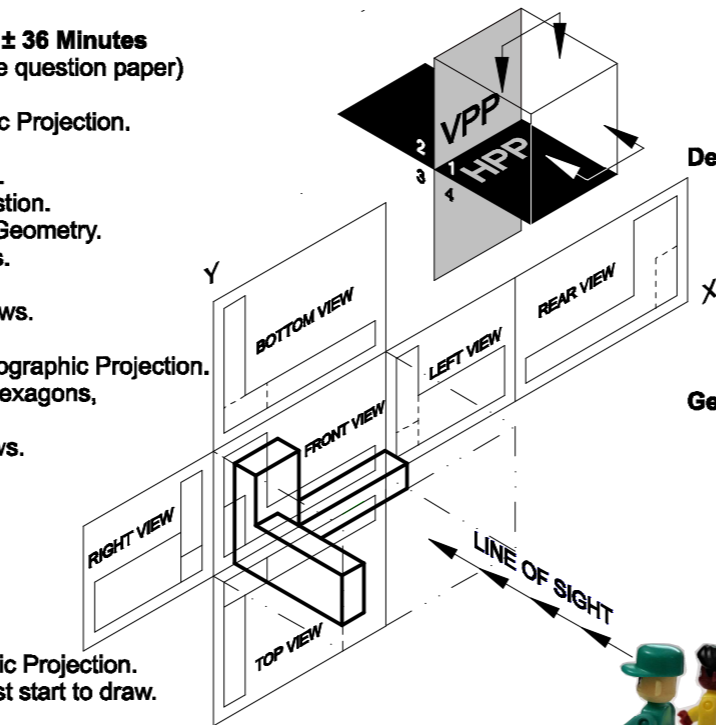
Detailed Civil Section: ± 35 Marks ± 32 Minutes

- The Civil Section will be drawn to a bigger scale to indicate more detail, usually scale 1:20.
- Substructure hatching should be completed in neat freehand. This will help to save time!
- Remember to draw the gutter, fascia board, rain-water downpipe if observed in the section.
- Always label the DPC (at window and floor), GL, and Finished Floor Level (FFL) in CAPITAL PRINTED lettering.
- You do not have to draw electrical symbols or sewage pipes on the Civil Section in EGD.
- The civil cutting plane will usually be through a door or sliding door and/or a window. Ensure you can correctly present the different building features including all Graphical Symbols on a sectional elevation.

General Notes for the Question Paper:

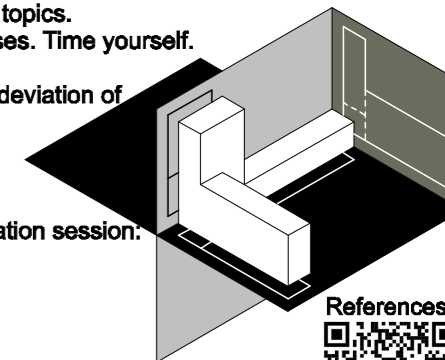
- Read every question thoroughly before you start to draw.
- Ensure that you can rotate/project the view of a given figure correctly in First Angle Orthographic Projection.
- Know the layout for all six primary views in First Angle Orthographic Projection.
- Never draw in pen. Labels should be either horizontal or vertical.
- Labels and abbreviations on a drawing must always be presented using PRINTED CAPITAL letters.
- Focus on Civil Analytical questions, Two-Point Perspective, and Civil Drawings, as these topics will be in the Civil Question Paper.
- If the question states that the drawing must be in free-hand, the drawing must be in free-hand.
- Dimensions of EGD drawings, Civil and Mechanical, will always be in millimetres (mm)-System International (SI) unit.
- The only exception to the use of the SI-unit is on certain dimensions of a Site Plan.
- All dimensions on drawings will always reflect the 'true' dimension or size regardless of the scale used.
- Scale 1:7 is seven times smaller. Scale 7:1 is seven times bigger.
- You must practice the drawings and not merely look at questions and answers.
- Never erase any construction lines used.
- If you are using stencils remember to indicate the construction lines.
- Draw for the complete duration of the examination session.
- Ensure that your drawing instruments are clean before the examination session starts.
- Use the assessment rubrics on the question papers as a checklist for completion of the drawing.
- Ensure that you have two tables at your disposal during the examination session. One for your A3 drawing board and one for your drawing instruments and examination paper.
- Refer to your EGD textbook to gain in-depth knowledge of the different EGD topics.
- Use previous EGD National Senior Certificate examination papers as exercises. Time yourself.
- Hidden detail must only be shown if instructed to indicate it.
- As accuracy is a fundamental and essential component of EGD drawings, a deviation of only 1 mm is permissible on the accuracy of all aspects of all drawings.
- Ensure you can construct Polygons using different construction methods.
- Neat Work = Neat Marks!

Previous NSC Question Papers All Subjects



Ensure that you have the minimum required drawing instruments for the examination session:

- Protractor, Eraser, Ruler, Compass, Divider, Circular Stencil.
- Large 30°/60° drawing set square.
- Large 45° drawing set square.
- A3 drawing board with a T-square.
- Masking tape / Insulation tape.
- Clutch pencil 0,3; 0,5 and/or drawing pencil: 2H, 3H or 4H.
- Calculator, Dust cloth, Sandpaper.



References



Question 1 - Mechanical Analytical: ± 30 Marks ± 27 Minutes

- Label and identification of views presented in Third Angle Orthographic Projection. Determining of dimensions on Mechanical parts.
- Ensure that you are able to correctly insert and present the Mechanical Cutting Plane on a given view.
- Know the elements of Welding Symbols and Machining and surface texture symbols including the different aspects represented on each symbol.
- Know all the different types of Sections for Mechanical parts:
Full section, Half section, Partial section, Revolved section, Removed section, Successive section, Multi-plane section and Aligned section.
- Remember that the Third Angle Orthographic Projection symbol appears on Page 5 of your Mechanical question paper.
- Do not leave any questions blank. All the answers can be found on the given drawing or in the title panel.
- Ensure that you understand what tolerance refers to and how to calculate the minimum and maximum tolerance. Know abbreviations of SPH, C/B, CSK, PCD, TOL, NTS, AF, MCD, etc.
- Know conventional representations of Gears, Shafts, S-brake, Square on a shaft, Screw thread, Stud bolt, Bolt and Nuts, Bearings, Coil springs, etc.
- You may also be asked to measure an angle with your protractor.
- Distinguish between a Fillet and a Rounding on a Mechanical part.

Question 2 - Loci: Cams and/or Mechanisms: ± 40 Marks ± 36 Minutes

(If you struggle with the content of question 2, first complete questions 1,3 and 4 of the question paper)

- Read the question thoroughly. Planning is essential for all EGD drawings.
- Always redraw the given views to obtain the minimum marks for the question, remember centre lines.
- Always divide a circle into segments by using your 30°/60° set square.
- Ensure that you can divide a straight line into any number of equal parts without using a calculator.

Loci of a Cam:

- Displacement Graph: Understand and apply construction methods for Uniform Motion, Uniform Acceleration, uniform Retardation, Harmonic motion, Uniform Acceleration and Retardation.
- Ensure you know what Dwell, Horizontal, Vertical, Diagonal, Clockwise and Counter-Clockwise refers to.
- Always indicate the direction of rotation with an arrow.
- Label the DISPLACEMENT GRAPH and include the Horizontal Scale used for the profile of the cam.
- Familiarise yourself with common types of followers used i.e. Wedge-ended and Roller-ended followers. Remember that measurements for the question can be given in the question and in the schematic figure.
- Remember to hatch the camshaft.

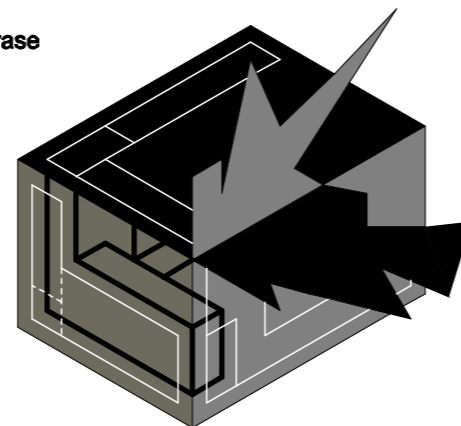
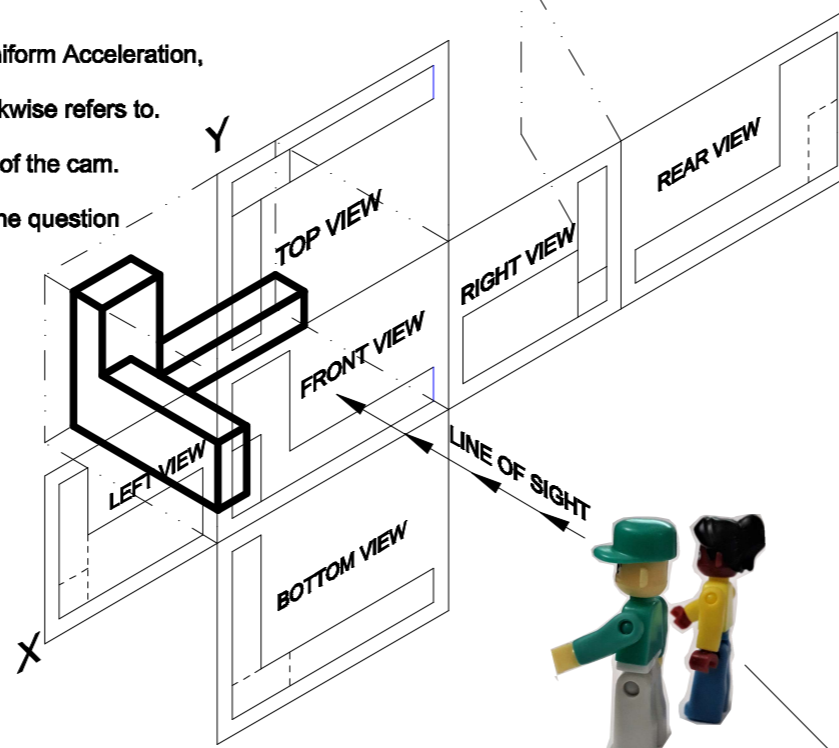
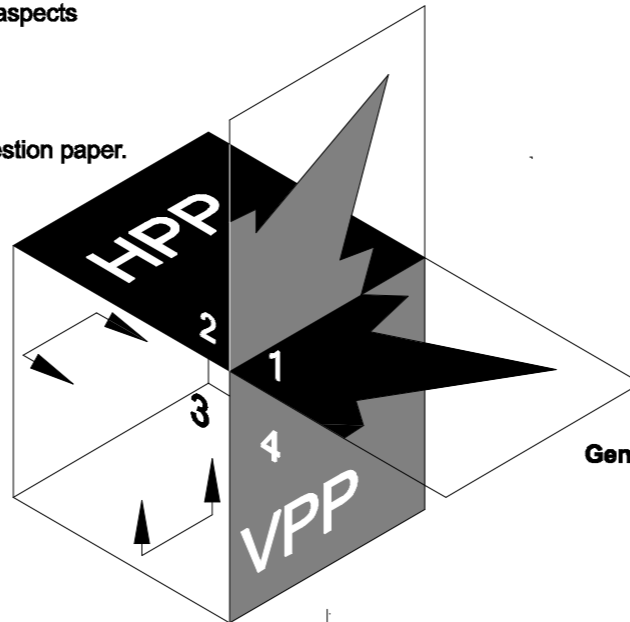
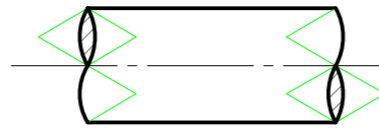
<AND/OR>

Loci of a Mechanisms:

- Understand the following terms: Strut, Rotation, Crank, Loci, Rod, Pivot, Linear and Link.
- Redraw the circles using the correct line types.
- Use numbers and/or letters to label different points of the Loci on different views to assist with completion of the drawing.
- Possible single line construction of a protective grill/frame around the Loci and the Mechanism.
- Know what a protective grill/frame is.

Question 3 - Isometric Drawing: ± 40 Marks ± 36 Minutes

- Plan your drawing by using the given reference point.
- Study and rotate the given orthographic views before you start to draw.
- Determine if there is a section present on the drawing, remember that hatching for Isometric drawings should be at 60°.
- Plan where you will draw your auxiliary views (clearly indicate aux. views).
- You will be required to construct auxiliary views of Polygons i.e. Triangles, Squares, Pentagons, Hexagons, Octagons and Angles.
- This question will contain Isometric Circles, always indicate the construction method used, do not erase any construction lines. Remember centre lines!

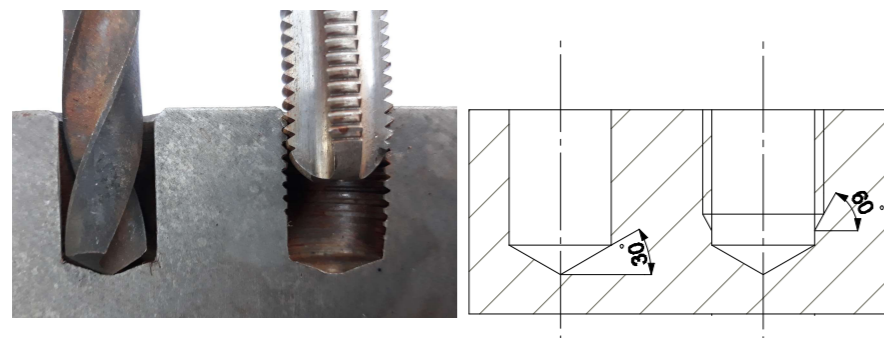


Question 4 - Mechanical Assembly: ± 95 Marks ± 85 Minutes

- Read the question thoroughly before you start to draw. Take enough time to plan your drawing on Page 6 and review Page 5 of the Mechanical Assembly.
- Determine which views must be drawn and sectioned.
- Use the exploded Isometric View on Page 5 to identify a 'main' part and draw the centre lines (horizontal and/or vertical) as a starting point.
- The 'main' part is usually a shaft where other parts fit around the shaft.
- Try to draw the view with the most circles first for projection purposes.
- Remember that the letter 'M' in M16 refers to the nominal diameter of the thread used for a part containing screw thread. M stand for Metric.
- Know basic formulas for Bolt and Nut construction i.e. Across Flats =Mx1,5. Bolt head Height =Mx0,7 Nut head Height =Mx0,8, etc.
- Always add all relevant centre lines to the drawing. Correctly indicate the Mechanical Cutting Plane on the required view. The arrows used must touch the Cutting Plane and the direction must be correct.
- Add Welding symbols and Machining symbols if instructed to do so.
- Check to see if the rule of symmetry may be applied to a view.
- If projection methods are not correctly applied, you will not finish with the drawing paper.
- Label views and title and check what other information is required to be represented on the drawing.
- Understand the function of Keys, Fillets, Roundings, Springs, Bushes, Countersink, Rib, Web, Blind hole, etc.
- Ensure that you are capable of constructing an Ellipse.
- Check the instructions if you are required to add any dimensions.

General Notes for the Question Paper:

- Read every question thoroughly before you start drawing.
- Practice and apply the following constructions: Bisecting lines and angles, Perpendicular lines, Line division, Circle divisions, Fillets, Roundings, Parallel lines for hatching, etc.
- Ensure that you can rotate the views of a given figure correctly in Third Angle Orthographic Projection
- Know the layout for each view in Third Angle Orthographic Projection.
- Never draw in pen.
- Labels and abbreviations on a drawing must always be presented in CAPITAL PRINTED lettering.
- Focus on Mechanical Analytical, Isometric Drawings, and Mechanical Assemblies, as these topics will be in the Mechanical Question Paper.
- If the question states that the drawing/feature must be presented in freehand, the drawing must be in freehand.
- All EGD drawings, Civil and Mechanical, will always be in Millimetres (mm) - System International (SI) unit.
- All dimensions on drawings will always reflect the 'true' dimension regardless of the scale used.
- Scale 1:7 is seven times smaller. Scale 7:1 is seven times bigger.
- You must practice the drawings and not merely look at questions and answers.
- Never erase any construction lines used.
- If you are using stencils remember to indicate the construction lines.
- Draw for the complete duration of the examination session.
- Ensure that your drawing instruments are clean before the examination session starts.
- Leave hatching of the sectioned parts for last as it is time-consuming work for the minimum amount of marks.
- Ensure that you have two tables at your disposal during the examination session: One for your A3 drawing board and one for your drawing instruments and examination paper if you are not using drawing desks.
- Refer to your EGD textbook to gain in-depth knowledge on the different EGD topics.
- Use previous EGD National Senior Certificate examination papers as exercises, time yourself per question.
- Hidden detail must only be indicated if instructed to do so.
- As accuracy is a fundamental and essential component of EGD drawings, a deviation of only 1 mm is permissible on the accuracy of all aspects of all drawings.
- Ensure that you can construct regular Polygons using different construction methods.
- Make a circle or a C on your hand/set squares before your drawing session starts, remember Centre Lines!



	Y	Y	Y	Y
	TOP VIEW		3 rd	
LEFT VIEW	FRONT VIEW	RIGHT VIEW	REAR VIEW	X
	BOTTOM VIEW			X

Previous NSC Examination Papers (All Subjects)

Previous NSC Examination Papers EGD Only

EGD Support Sheet

References