PREAMBLE

The West African Senior School Certificate Examination in Technical Drawing covers all sections of the examination syllabus to ensure that the student is adequately equipped with the basic knowledge required for engineering and allied subjects at the Post – Secondary school level.

This syllabus is strictly an examination syllabus and does not imply any order in which the topics should be taught. Candidates are expected to have good understanding and thorough coverage of the topics through practical exposure to real life situations such as visits to building sites, engineering workshops, use of models, charts and other resource materials.

OBJECTIVES

Candidates shall be expected to demonstrate the ability to:

(a) visualize and understand graphical information;
(b) express ideas and describe objects with appropriate graphical methods and tools;
(c) arrange ideas and information systematically and accurately;
(d) identify and use conventions and symbols of Technical Drawing as required by the appropriate Standard bodies (e.g. BS, ISO);
(e) use the knowledge of Technical Drawing to solve problems graphically;
(f) demonstrate good draughtsmanship.

GENERAL NOTES

The use of drawing board ISO A2 (420 x 594 mm), T-square, Sets-square, pair of compasses and other drawing aids is required.
Candidates shall be expected to draw to the recommendations of the current "drawing Office practice for Architects and Builders" BS 1192 (metric); and "Engineering Drawing Practice" BS 308A (metric)

Candidates may be required to answer questions in either 1st or 3rd Angle Projection.

STRUCTURE OF THE EXAMINATION

The examination shall consist of two (2) papers both of which are compulsory.

PAPER 1: (Objective/Geometrical Drawing)

This shall be of 2½ hours duration, consisting of two sections: A and B.

Section A: Shall consist of 40 compulsory multiple choice for

40 marks and will last for 1 hour. The section will be in two parts, I and II.

Part I: Shall consist of 30 questions numbered 1 – 30 and will be on general principles, techniques, uses of plane and solid geometry.

Part II: Shall consist of two alternatives: IIA (Building Drawing) and IIB (Mechanical Drawing). Each shall consist of 10 questions numbered 31 – 40 respectively. Candidates are expected to answer the questions in either part IIA or IIB.

Section B: Shall consist of 4 questions on plane and solid geometry. It will carry 60 marks and will last 1½ hours. Candidates shall be expected to answer 3 questions.

PAPER 2: (Short Structured Questions and Practical Drawing)
This shall be of 2½ hours duration consisting of two Sections: A and B:

Section A: Shall consist of two parts, I and II, Candidates are expected to answer either of the two parts for 30 marks.

Part I: (not available to candidates in Ghana)
Shall consist of 10 structured questions covering the entire syllabus for 30 marks in 45 minutes.

Part II: (not available to candidates in Nigeria) shall consist of 3 questions requiring sketches of objects, components and tools used in the building and mechanical workshops. Candidates shall be required to answer two questions: Questions I and any other one for 30 marks in 45 minutes.

Section B: Shall consist of two questions: one each on Building Drawing and Mechanical Drawing. Candidates shall be required to answer either of the two questions in 1¾ hours for 70 marks.

WEST AFRICAN SENIOR SCHOOL CERTIFICATE EXAMINATION
TECHNICAL DRAWING

DETAILED SYLLABUS

PRELIMINARIES

CONTENT	NOTES
1. Types of drawing and application.	Pictorial and orthographic.
Uses and care of equipment.	
2. Lines, Lettering and Dimensioning	
Types of lines and their uses. Types and styles of lettering. Title blocks, Border lines,	Should conform to appropriate Standards and specifications. e.g. (BS, ISO).
Dimensioning: Principles and techniques.	

PLANE GEOMETRY

3. Division of lines into a given number of equal parts or proportion and its applications.	Simple exercises involving mathematical problems.
4. Plain and Diagonal scales and their uses including scale of chords.	
5. Measurement and construction of angles.	Exercises involving the use of protractor and a pair of compasses.
6. Triangles, quadrilaterals and polygons	Regular and irregular figures.
7. Circle and its properties.	
8. Tangency involving circles, arcs and lines.	Blending of lines and curves. Mutually tangential circles – both internal and external. Application of principles of tangency to spanners, anchors and other tools and parts.
9. Inscribed, circumscribed and escribed figures.	
10. Similar figures (enlargement and reduction).	Equivalent and proportional figures determined either by area or sides.

CONTENT	NOTES
11. Areas of figures.	Determination of areas by construction
12. Loci	Construction of straight lines, circles, ellipses, parabolas, hyperbolas, helices, trochoids, (inferior and superior) spirals, cycloids, hypocycloids, epicycloids, involutes and link mechanisms.

SOLID GEOMETRY

CONTENT	NOTES
13. Pictorial drawing – isometric, oblique, perspective.	Approximate methods for drawing oblique and isometric curves. Isometric scale, dimensioning cabinet, cavalier etc. One and two points perspective. Isometric circles.
14. Freehand sketches of simple objects	Pictorial and orthographic forms.
15. Orthographic projection.	Both 1st and 3rd angle projections.
16. Auxiliary projection of geometrical figures	Prisms, cones, cylinders, pyramids (right or oblique) or combinations of them. (including second auxiliary projection).
17. Traces of a line, true length of straight lines, points and line relationship Location of points and lines in space. True lengths and true angles of a line, Intersecting lines. Plane relationships, Types of planes and edges Views of a plane True shape of lamina.	Including application to plane figures and intersecting planes.
18. Sectional views and true shapes.	Including true shapes of sections of prisms, cylinders, pyramids and cones (ellipse, parabola, hyperbola, circle, triangle).
19. Development	Surfaces of right and oblique pyramids, prisms, cylinders and cones and their frustums. Transition pieces.
20. Interpenetration	Intersection of surfaces.

BUILDING DRAWING

The recommendations of the current BS 1192 (metric) should be followed.

CONTENT	NOTES
1. Freehand drawing.	Including both pictorial and orthographic sketches of building details and tools used in the building industries.
2. Intersection of straight and curved Moulding in the same plane.	Including the determination of the true shape of mitres.
3. Construction of arches	Semi-elliptical, segmental, semi-circular, tudor, equilateral parabolic etc.
4. Roofs – flat, pitched, gabbled, butterfly, lin-to, etc.	Including development of roof-surfaces and determination of bevels.
5. Simple working drawings and details.	Examples should include simple houses, garages, sheds, etc. Dimensioning and lettering may be tested. Conventional representation of materials and fittings.
6. Constructional details of parts of buildings.	e.g. foundations, walls and openings, jambs, sills, lintels, roofs, doors, windows, staircases (half-turn, dog-leg, straight-flight) frames, linings and architraves, floors. Simple reinforcement for columns, beams, piers, slabs etc.
7. Orthographic projection of buildings.	Including sectional views and the use of different scales. Up to 2 floors only.

MECHANICAL DRAWING

The recommendations of the current BS 308A (metric) should be followed.

CONTENT	NOTES
1. Freehand drawing.	Including both pictorial and orthographic sketches of engineering components, tools, electrical circuits and plant layouts. Plumbing and Welding symbols should be known.
2. Dimensioning	Emphasis on correct techniques.
3. Fasteners and locking devices-conventional representations.	Permanent and temporary joints e.g welded and riveted joints, bolts and nuts, screws, studs, splined shafts, cotters, collars, keys etc.
4. Helices and their applications.	Including screw threads and springs (both left and right handed).
5. Working and assembling drawing and details in both first and third angles projections.	Dimensioning, reference balloon, parts list, title blocks, lettering and good draughtmanship will be examined,
6. Sectioning	Full, half, part, offset, broken, removed, aligned, revolved sections etc.

LIST OF MATERIAL/TOOLS REQUIRED FOR TECHNICAL DRAWING

1. Standard Drawing Board
2. T-Square
3. Clips or Drawing Pins
4. French Curve
5. Flexible Curve
6. Eraser
7. 30”/60” and 45” set squares
8. Drawing Set
9. Pencils (HB, 2H)