#### **TECHNICAL DRAWING**

#### **SCHEME OF EXAMINATION**

There will be three papers, Papers 1, 2 and 3 all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

PAPER 1: will consist of forty multiple-choice objective questions all of which are to be answered in 1 hour for 40 marks. The paper will consist of two sections, Sections A and B as follows:

Section A will consist of thirty questions drawn from the general principles, techniques and uses of plane and solid geometry.

Section B will consist of ten questions in each of two alternative parts: Part I (Building Drawing) and Part II (Mechanical Drawing). Candidates will be required to answer questions in one part only.

- PAPER 2: will consist of five essay questions on plane, solid and vector geometry.

  Candidates will be required to answer any three of the questions in 134 hours for 60 marks.
- PAPER 3: will consist of two sections, Sections A and B to be taken in 2¾ hours for 100 marks.

Section A will consist of three questions requiring sketches of objects, components, symbols and tools used in the Building and Mechanical industries. One of the questions will be compulsory.

Candidates will be required to answer the compulsory question for 20 marks and one of the other questions for 10 marks. The section will require 45 minutes.

Section B will consist of two questions: one on Building Drawing and the other, on Mechanical Drawing. Candidates will be required to answer only one of the questions in 2 hours for 70 marks.

#### **DETAILED SYLLABUS**

#### **PLANE GEOMETRY**

S/NO.	CONTENTS	NOTES	
	Drawing materials and equipment,	Standard size drawing A2 ISO board and drawing	
1 types of drawing and applications sh		sheet, set squares, drawing instruments,	
		protractor and T-square.	

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2	Lines, lettering and dimensioning	Types of lines and their uses. Types and styles of lettering, title blocks and border lines. These should conform to BS 1192 and BS 308A.	
3	Division of lines and its applications	Dividing into a given number of equal parts or proportion and other simple exercises involving mathematical problems.	
4	Scales and their uses	Plain and diagonal scales, constructions and their applications, including scale of chords.	
5	Angles	Types and their constructions.	
6	Triangles, quadrilaterals and other polygons	Regular and irregular polygons: properties and their constructions.	
7	Circles	Parts, types, properties and their constructions.	
8	Tangents and tangency	Construction and application of principles of tangency to spanner, anchors and other tools.	
9	Inscribed, circumscribed and escribed figures	Definitions, identification and their constructions.	
10	Similar figures and areas	Enlargement and reduction by area and side.	
11	Loci	Definition and construction of straight line, circle, ellipse, parabola, hyperbola, helix, trochoids (inferior and superior) spiral, cycloid, hypocycloid, involutes and link mechanisms.	
		GEOMETRY	
12	Lines in space and planes	Location of points and lines in space. True length and angle of inclination of a line. Intersecting lines, plane relationships and traces.  Types of planes and edge views of planes.	
13	Pictorial drawing: isometric, oblique, perspective	Isometric scales and circles, oblique scales and curves. One and two points perspective, including free hand sketching.	
14	Orthographic projection	Multiplane,1st and 3 <sup>rd</sup> angle projection.	
15	Auxiliary projections	Prisms, cones, cylinder, cube, pyramid (right and oblique), including second auxiliary projection.	
16	Sectional views and true shapes	True shape of sections of prisms, cylinders pyramids and cones, (ellipse, parabola, hyperbola, circle and triangle).	
17	Development of surfaces	Surfaces of right and oblique pyramids, prisms, cylinders, cones and their truncated parts and frustum .Transition pieces.	
18	Intersection /Interpenetration	Intersections of cylinders, cones, prisms and pyramids.	

SYMBOLS AND CONVENTIONS			
19	Symbols and conventions	Example, the symbol used to indicate the diameter of a	
	used in plane and solid geometry	circle.	

#### **VECTOR GEOMETRY**

S/N	CONTENTS	NOTES	
	Forces:	Graphical determination of resultant, using	
20	co-planer,con-current and parallel	Bow's notation. Equilibrant and reaction using	
		triangle and polygon of forces.	
21	Simple framed structure	Determination of reactions and internal forces	
		of members and nature of forces.	
22	Shearing force and bending moment	Simple supported beams and cantilevers with	
	diagrams	concentrated and uniformly distributed loads.	
23	Centre of gravity of lamina	Simple geometrical shapes.	

NOTE: Vector Geometry is for candidates in Ghana only and will be examined in Paper 2.

### **BUILDING DRAWING**

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

S/NO.	CONTENT	NOTES	
1	Freehand sketching and identification of	Both pictorial and orthographic sketches of building	
	building tools	tools.	
2	Foundations and Floors	Types and parts of foundations and floors.	
3	Openings – windows, doors and arches	Types and parts of doors, windows and arches.	
4	Stairs and staircases	Parts and types of staircases.	
5	Roofs	Types and parts of roofs.	
6	Constructional details of parts of buildings	Includes wall, column, beam, lintel, etc.	
7	Working drawings of buildings	Orthographic projections and sectional views.	
8	Building materials, freehand sketching,	Including electrical and plumbing fittings.	
	symbols and conventions		

### **MECHANICAL DRAWING**

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

S/NO.	CONTENT	NOTES
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1	Freehand sketching and identification of	Both pictorial and orthographic sketches of mechanical	
	mechanical tools	tools.	
2	Dimensioning	Limits and fits, allowances, tolerances; emphasis on correct techniques.	
3	Screw threads, fasteners and locking devices	Include conventional representation, construction and their applications.	
4	Sectioning	Full,half-part,offset,broken,removed,aligned and revolved.	
5	Pictorial drawing	Isometric and oblique drawing; including freehand sketching.	
6	Working and assembly drawing.	Orthographic and sectional views.	
7	Symbols, conventions and abbreviations	Include electrical and plumbing fittings and welding symbols.	

## LIST OF RECOMMENDED TEXTBOOKS

S/N	TEXT BOOKS	AUTHORS	PUBLISHERS
1	TECHNICAL DRAWING FOR		
	SCHOOL CERTIFICATE AND G.C.E	J.N GREEN	SPECTRUM BOOKS
	(Metric Edition)		
2	ENGINEERING DRAWING with	M.A PARKER AND	NELSON THORNS
	worked examples 1 & 2	F.PICKUP	LTD
	(3 <sup>rd</sup> edition)		
3	GEOMETRIC AND ENGINEERING	K.MORLING	
	DRAWING		
4	GEOMETRIC AND TECHNICAL	A.YARWOOD	ELBS with NELSON
	DRAWING		
5	FOUNDATION OF TECHNICAL	A.PARKISON	
	DRAWING		
6	TECHNICAL DRAWING with	W.E.KUDOR	
	Mechanical Engineering & Drawing		
	option		