Instructions to candidates

(a) You should have the following for this examination:
   Answer sheet;
   Drawing instruments;
   3 sheets of drawing paper size A3;
   Scale rule.
(b) This paper consists of three sections: A, B and C.
(c) Answer all the questions in sections A and B and any other two questions from section C.
(d) Questions in section A must be answered on the answer sheet provided.
(e) Questions in section B and C should be answered on A3 sheets of drawing paper provided.
(f) All dimensions are in millimetres unless otherwise stated.
(g) Candidates may be penalised for not following the instructions given in this paper.
(h) This paper consists of 10 printed pages.
(i) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
(j) Candidates should answer the questions in English.
SECTION A (50 marks)

Answer all the questions in this section on the answer sheet provided.

1. (a) State one disadvantage of using each of the following items to hold paper on the drawing board.
   (i) Marking tape
   (ii) Thumb pins

   (b) (i) Give one disadvantage of oral communication when representing an engineering object.
   (ii) Give one reason for observing established standards in manufacturing industry.

2. (a) Sketch each of the following lines:
   (i) Hidden detail
   (ii) Folding line
   (iii) Centre line
   (iv) Cutting plane

   (b) State the meaning of each of the symbols shown in Figure 1.

   (i) 
   (ii) 
   (iii) 
   (iv) 

   Figure 1
3. (a) **Figure 2** shows an elevation of a template.

![Figure 2](image)

Measure the dimensions for the:

(i) Circle

(ii) Radius

(iii) Angle of the slanting face

(b) List six computer programs that can be used to produce a drawing.

4. (a) Define each of the following properties of materials:

(i) plasticity

(ii) elasticity

(b) State four ways in which design ideas are communicated.

5. (a) List four factors to consider when lettering.

(b) State three effects of poor disposal of engineering materials to the environment.
6. Enlarge Figure 3 (ABCD) in the ratio of 5:7  

![Figure 3](image)

(4 marks)

7. Construct a triangle whose perimeter is 240 mm and the sides are in the ratio 4.5:6.0:7.5. Measure the smallest angle.  

(5 marks)

8. Figure 4 shows the front elevation and incomplete plan of a truncated square-based pyramid.

(a) complete the plan.

(b) draw the true shape of the cut face.  

(5 marks)

![Figure 4](image)
9. **Figure 5** shows two views of a machined bracket drawn in first angle project.

![Figure 5](image)

Sketch in good proportion, the isometric view of the block taking X as the lower point. 

(5 marks)

10. **Figure 6** shows two views of a block drawn in first angle project. In good proportion sketch the block in oblique projection.

![Figure 6](image)

(6 marks)
SECTION B (20 marks)

*Question 11 is compulsory*

*It should be answered on the A3 paper provided.*

11. **Figure 7** shows parts of a machine component drawn in first angle projection. Assemble the parts and draw, **FULL SIZE**, the following:

   (a) sectional front elevation along the cutting plane B-B;

   (b) end elevation.

Insert three leading dimensions.

Unspecified dimensions are left to the candidate's discretion. Hidden details are not required.
Dimensions in mm

Drawing not to scale

Figure 7

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916104

Turn over
12. In the mechanism shown in Figure 8, the crank EF rotates about centre E while GH oscillates about G.

Plot the locus of point P for one complete revolution of EF. (15 marks)
13. Figure 9 shows two intersecting square tubes A and B drawn in first angle projection.

![Diagram of two intersecting square tubes A and B.]

Figure 9

(a) copy the figure and complete:

(i) the front elevation;

(ii) the plan.

(b) Draw the development of tube B. (15 marks)
14. **Figure 10** shows an inclined plan of a block and its front elevation.

![Diagram](image)

**Figure 10**

Copy the given layout and draw the two point perspective of the block showing all construction details. (15 marks)

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