1301/312
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1305/312
TECHNICAL DRAWING
June/July 2019
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN CARPENTRY AND JOINERY
CRAFT CERTIFICATE IN MASONRY
CRAFT CERTIFICATE IN PLUMBING

TECHNICAL DRAWING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
- *Answer booklet;*
- *Drawing papers size A2;*
- *Drawing instruments.*

*This paper consists of **EIGHT** questions.*
*Answer **FIVE** questions in the answer booklet provided.*
All questions carry equal marks.
Maximum marks for each part of a question are as indicated.
All dimensions are in millimeters.
Candidates should answer the questions in English.

This paper consists of 9 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

1. (a) **Figure 1** shows a piece of solid round steel of diameter 40 mm and length 20 mm.

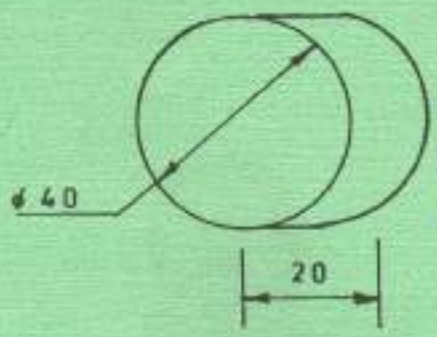


Fig. 1

Draw, full scale, an isometric view of the piece of steel using drawing instruments. (10 marks)

(b) Construct an ellipse in a rectangle measuring 100 x 80 mm. (10 marks)

2. (a) Construct a cycloid of a circle of radius 20 mm which makes one complete rotation without slipping on its path. (10 marks)

(b) **Figure 2** shows a hexagonal prism cut as shown.

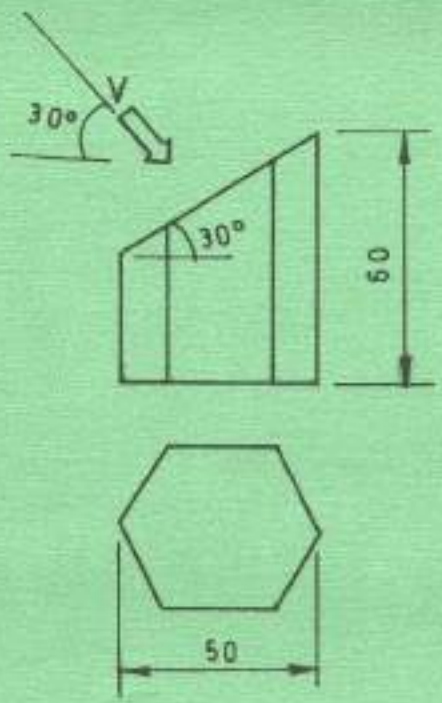


Fig. 2

Draw an auxiliary view of the prism viewed from the direction of arrow V. (10 marks)

3. (a) Construct an arc of radius 35 mm which blends externally with two unequal circles 60 mm centre to centre. The radii are $r_1 = 15$ mm, $r_2 = 30$ mm. (10 marks)

(b) **Figure 3** shows three orthographic views of a bracket drawn in 1st angle projection.

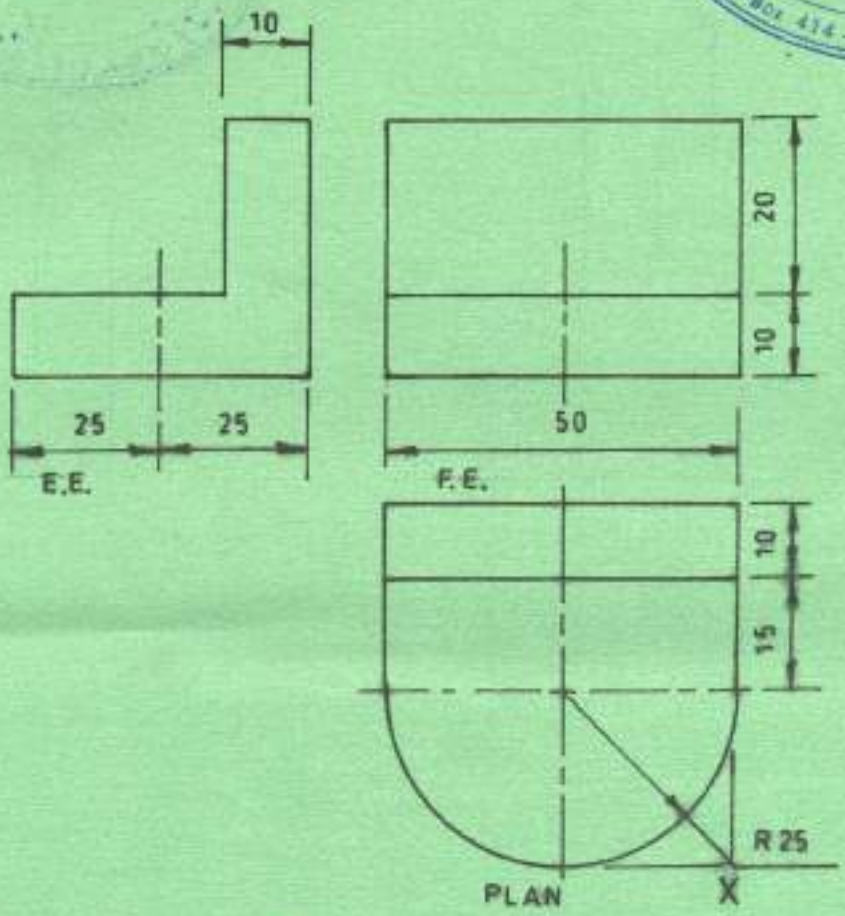


Fig. 3

Draw an isometric view of the bracket with corner X as the lowest point.

(10 marks)

4. **Figure 4** shows a machine mounting.

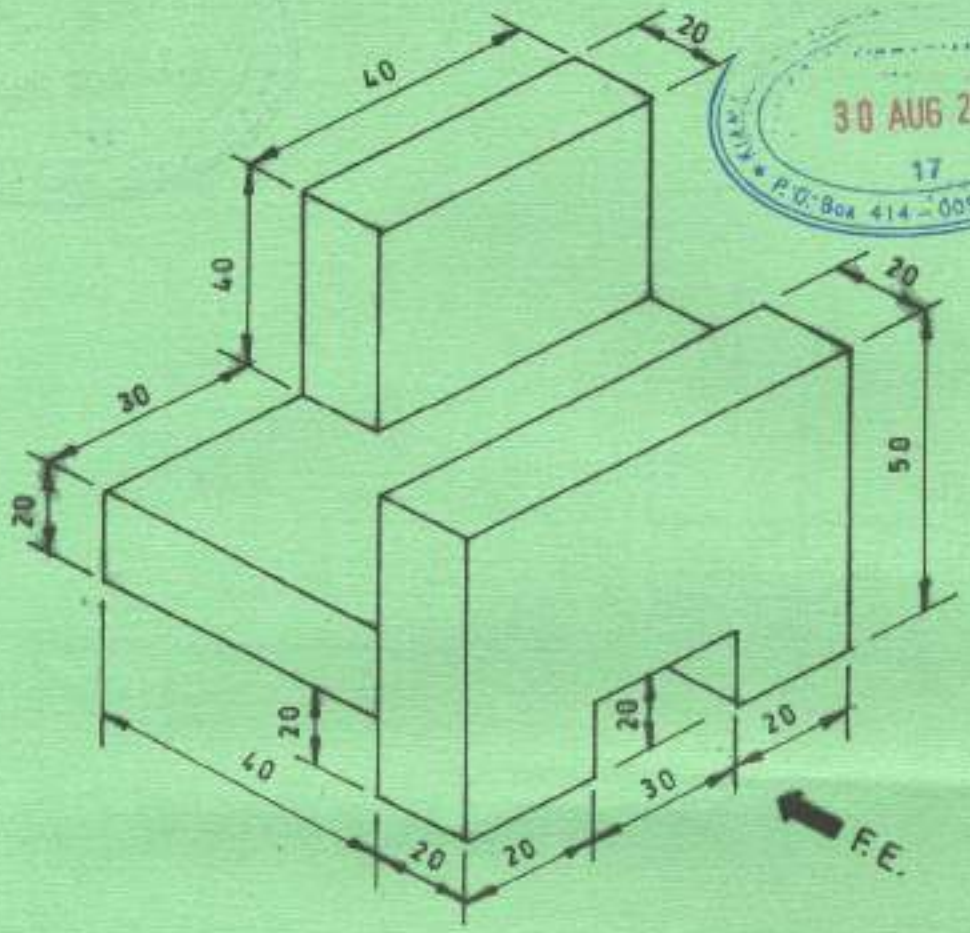
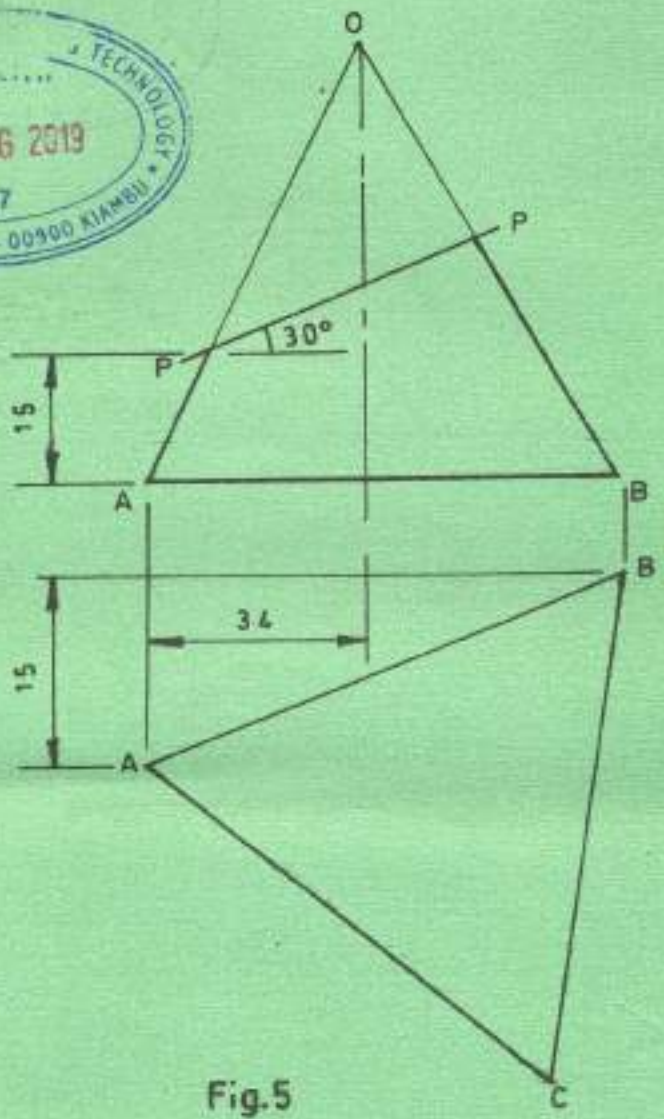


Fig. 4

Draw the three orthographic views of the mounting with the front elevation viewed from the direction of arrow F.E. (20 marks)

5. **Figure 5** shows a triangular pyramid cut by a cutting plane P-P as show.



AB = 60 mm
BC = 60 mm
AC = 60 mm

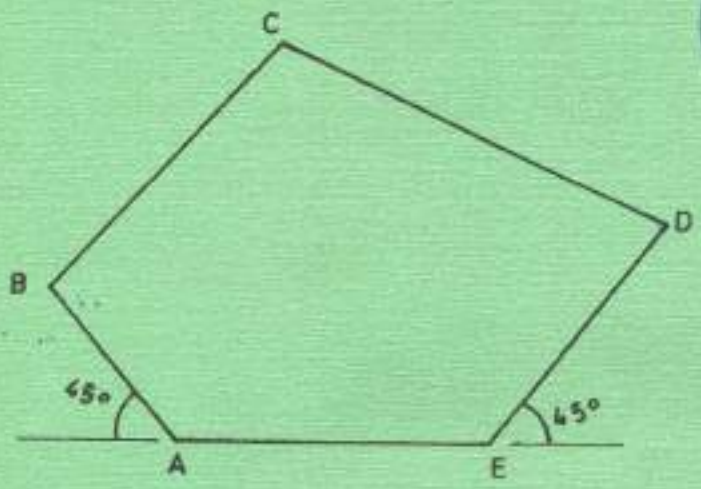
Fig.5

Draw and complete the following:

(a) front elevation;
(b) plan;
(c) draw the development of the pyramid when opened along edge OB.

(20 marks)

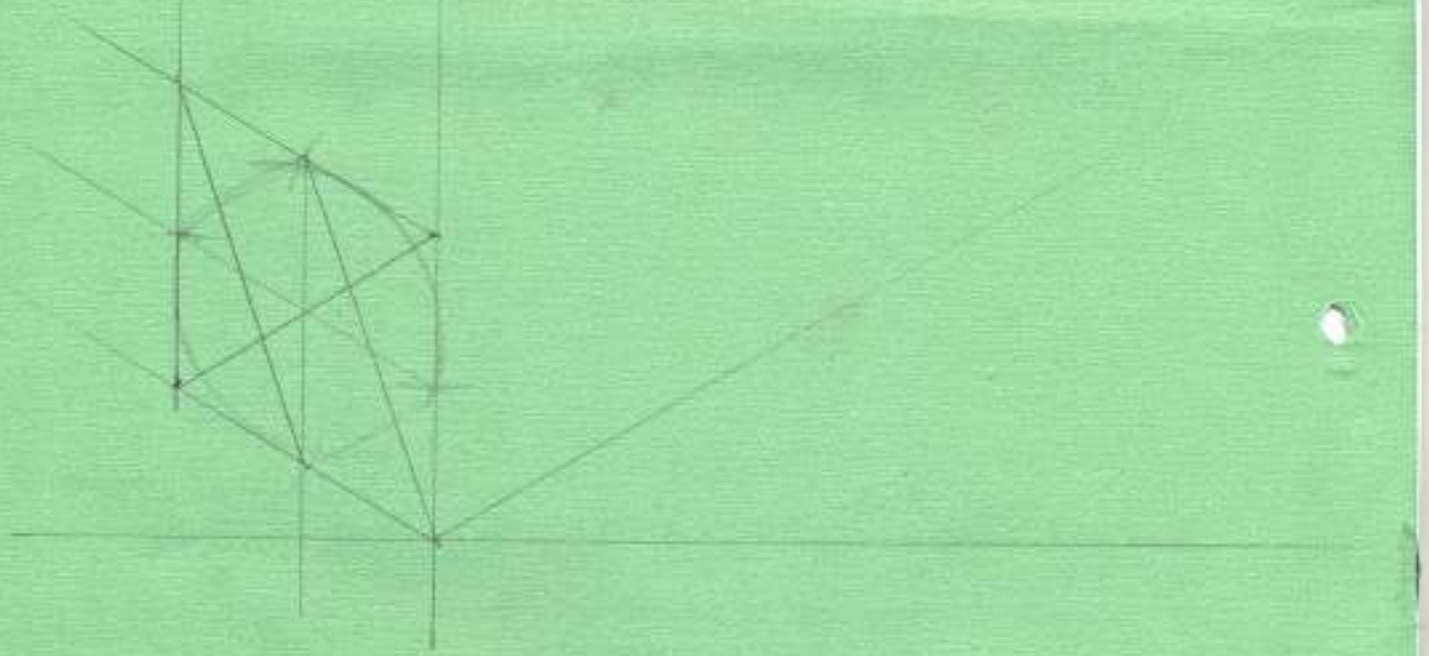
6. (a) **Figure 6** shows an irregular pentagon ABCDE.



AB = 45 mm
AE = 43 mm
ED = 60 mm
BC = 70 mm
CD = 60 mm

Fig. 6

Construct a similar pentagon to a scale of 3:5 using radial method. (10 marks)



(b) **Figure 7** shows a solid bracket with a web.

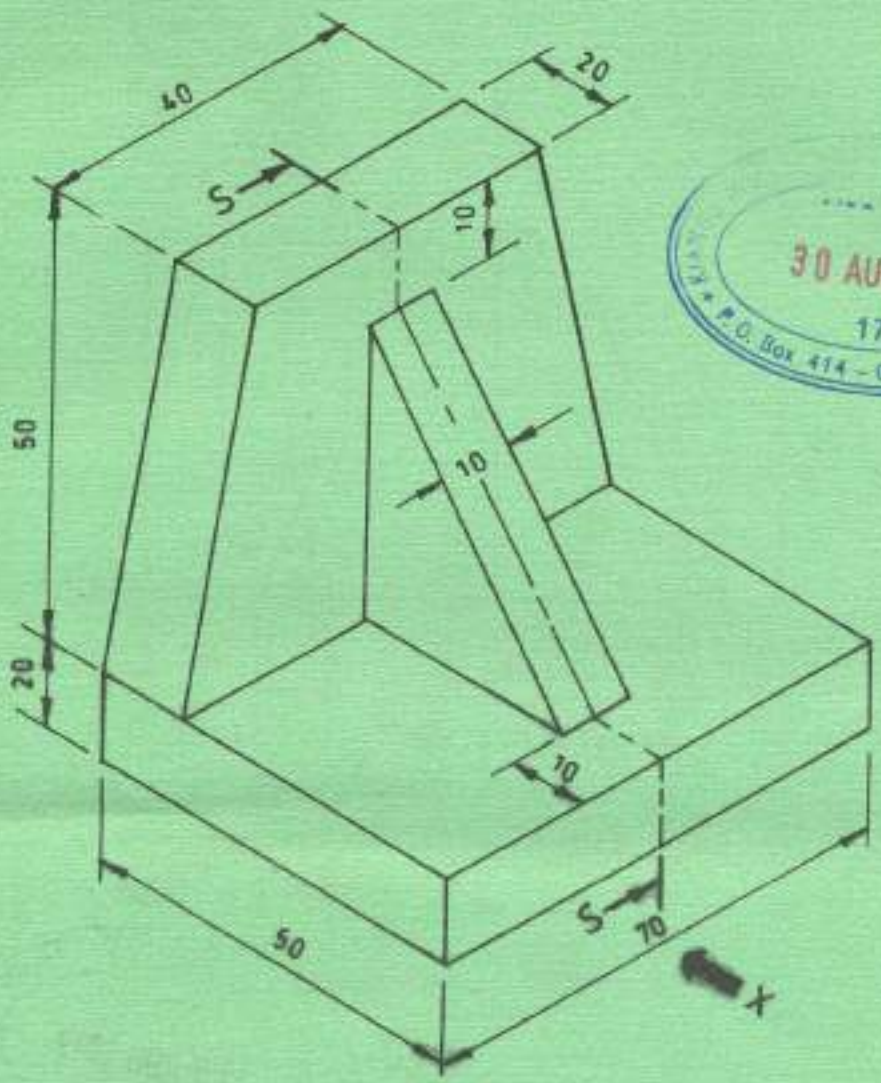


Fig.7

Draw the following orthographic views (full scale) in 1st angle projection:

(i) Front elevation in the direction of arrow X;
(ii) Sectioned end elevation along S-S;
(iii) Plan. (10 marks)

7. **Figure 8** shows a front elevation of a square pyramid meeting with a square prism at a right angle to the centre line.

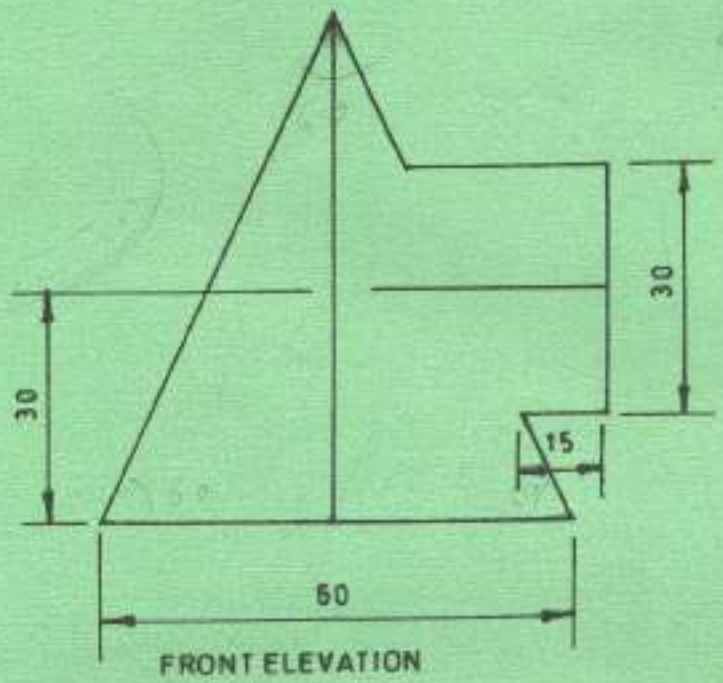


Fig. 8

Draw the three orthographic views in 3rd angle projection. (20 marks)

8. **Figure 9** is a floor plan of part of an ablution block.

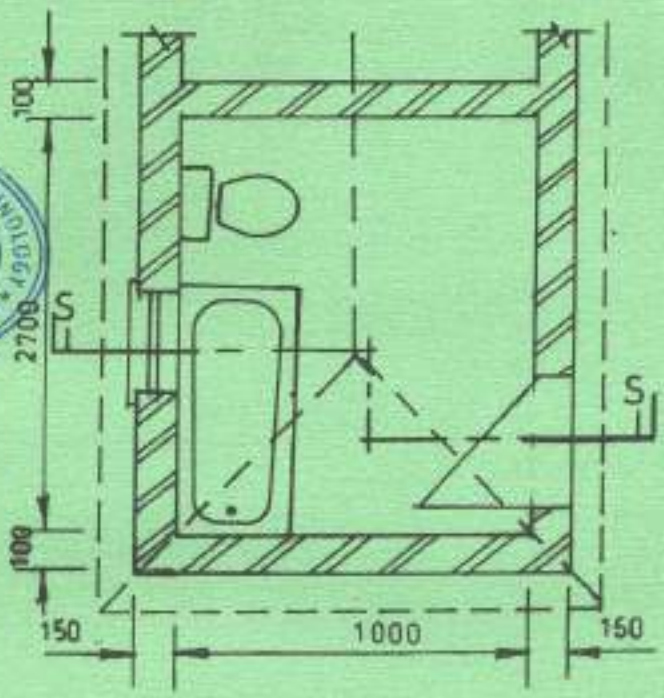


Fig. 9

Use the data given below and draw a sectional elevation S-S from the foundation to the roof.

Pitch of roof = 30°
Height of wall = 780 mm
Walling material 450 mm x 225 x 150 mm blocks
Door size = 780 x 1800 mm
Window height = 1350 mm
Rafters = 100 x 50 mm
Wall plate = 100 x 50 mm
Purlins = 75 x 50 mm
Plaster =15 mm

Use Scale 1: 10
Assume any other detail not given. (20 marks)

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