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APPLIED GEOMETRY
Oct./Nov. 2018
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

ARTISAN CERTIFICATE

**GENERAL FITTER
MOTOR VEHICLE MECHANICS
AGRICULTURAL MECHANICS
WELDING AND FABRICATION
ELECTRICAL INSTALLATION
CARPENTRY AND JOINERY**

**PAINTING AND DECORATING
MASONRY
PLUMBING
GARMENT MAKING
LEATHERWORK TECHNOLOGY
GENERAL AGRICULTURE**

APPLIED GEOMETRY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Drawing papers;

Mathematical tables/Scientific calculator;

Drawing instruments.

This paper consists of SIXTEEN (16) questions in THREE sections; A, B and C.

Answer ALL questions in section A, ONE question from section B and TWO questions from section C.

Answers to the questions must be done on the drawing papers provided.

All questions carry equal marks

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This question paper consists of 7 printed pages.

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

SECTION A (40 marks)

100/10

70/10

Answer ALL the questions in this section.

1. ~~Construct~~ an ellipse of major axis 100 mm and minor axis 70 mm using concentric circles method. (4 marks)
2. Construct a hexagon of sides 40 mm. (4 marks)
3. Construct an external tangent to two circles of $\phi 40$ mm and $\phi 50$ mm and centre distance 70 mm. (5 marks)
4. A triangle is of perimeter 175 mm and sides in the ratio 3:5:7. Construct the triangle. (3 marks)
5. Construct a circumscribing circle to a triangle ABC of sides AB = 45 mm, BC = 55 mm and AC = 70 mm. (4 marks)
6. Construct a cycloid generated by a point on the circumference of a $\phi 30$ mm cylinder through one complete revolution without slip. (5 marks)
7. Figure 1 shows a front view and a plan of a cylinder. Construct an isometric view of the cylinder full size. (4 marks)

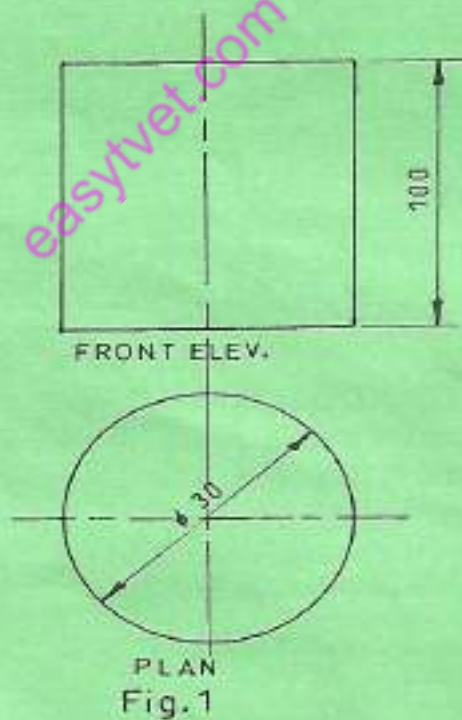


Fig. 1

8. Two circles are of $\phi 50$ mm and $\phi 30$ mm and centre distance 80 mm. Construct an arc whose centre is 60 mm away from the circumference of each circle to touch the circles. (4 marks)

175/10
175/10

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9. Construct a plain scale, 30 mm = 10 mm, 40 mm long to read 1 mm. (3 marks)
10. Figure 2 shows a block with a centrally located through hole. Draw an oblique view of the block. (4 marks)

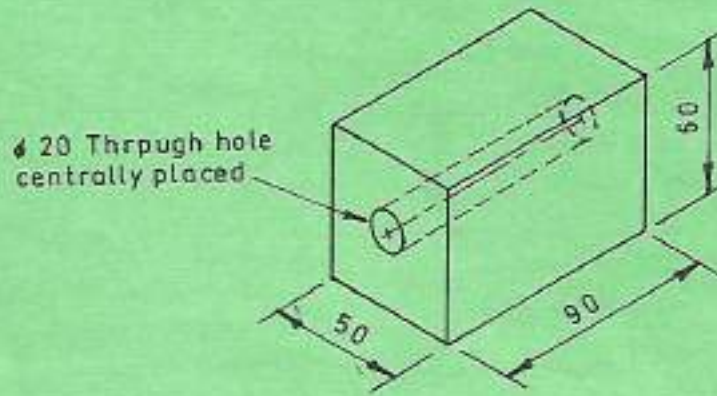


Fig. 2

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SECTION B (30 marks)

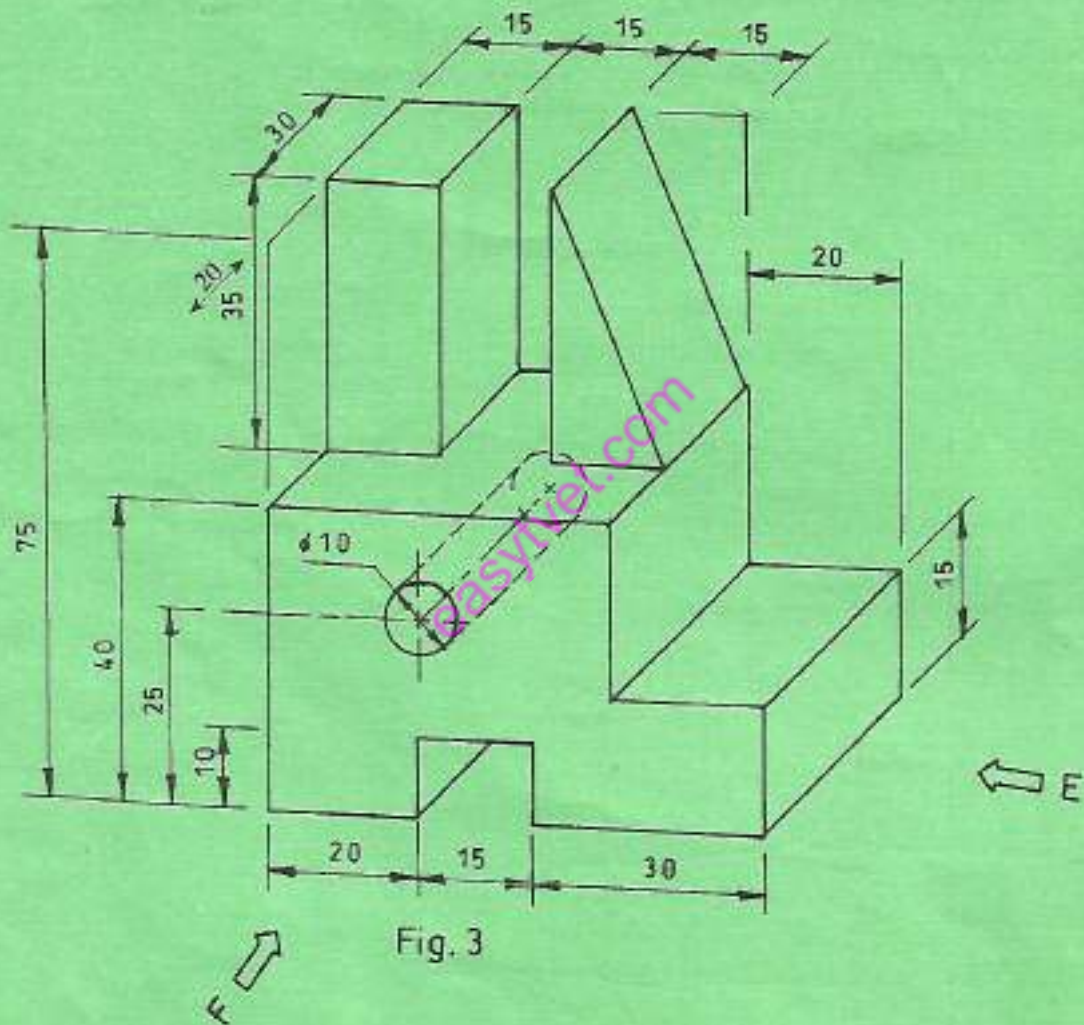
Answer any ONE question from this section.

11. Figure 3 shows part of a machine block. Draw full size first angle orthographic projection of the following views:

- (i) front elevation viewed in the direction of arrow 'F';
- (ii) end elevation viewed from arrow 'E';
- (iii) plan.

Indicate three dimensions.

(30 marks)



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12. Assemble the parts in Figure 4 and draw the front elevation and plan.

(30 marks)

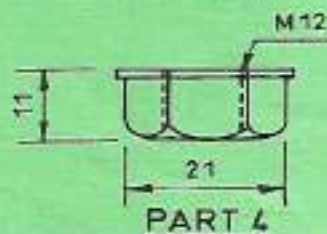
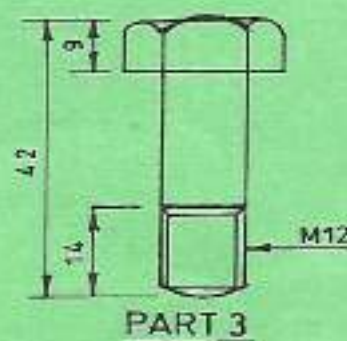
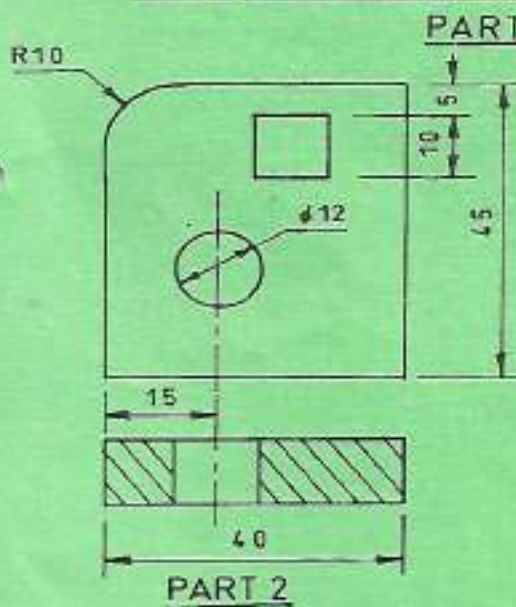
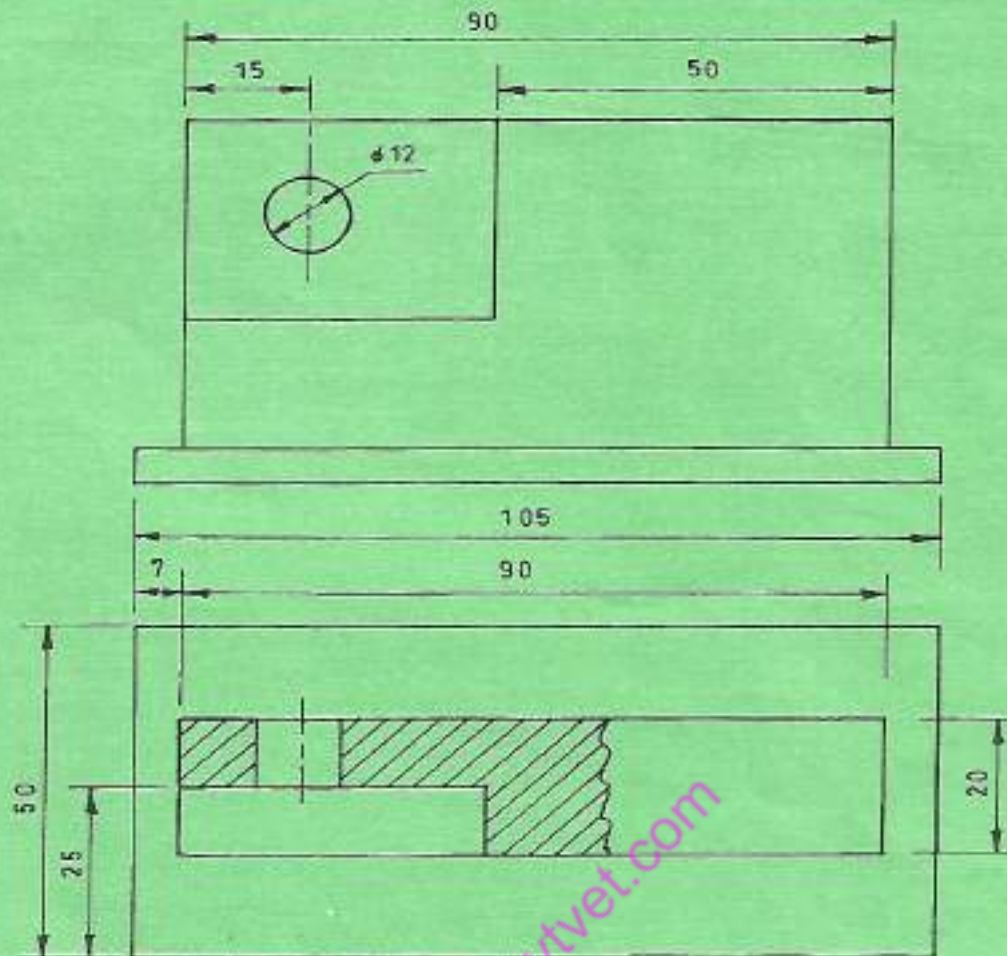




Fig. 4

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13. Make free hand sketches of each of the following:

- (a) leather apron;
- (b) goggles;
- (c) safety boots;
- (d) helmet;
- (e) fire extinguisher;
- (f) dust mask;
- (g) thimble; 
- (h) needle; 
- (i) oil can;
- (j) food flask.

(30 marks)

SECTION C (30 marks)



Answer any **TWO** questions from this section.

14. Figure 5 shows views of truncated square pyramid. Draw the two views and its surface development. (15 marks)

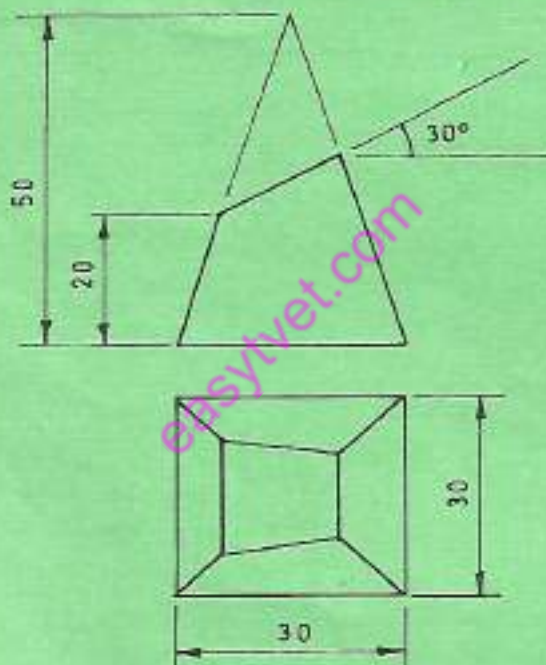


Fig. 5



15. Make free hand sketches of the following:

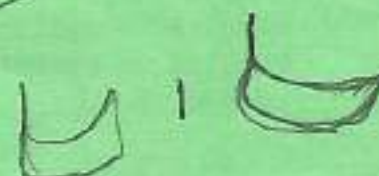
- (a) ballpein hammer;
- (b) soldering iron;
- (c) hand file;
- (d) mallet;
- (e) glove.



(15 marks)



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16. Figure 6 shows orthographic views of a metal block. Draw the isometric pictorial view with 'X' as the lowest point. (15 marks)

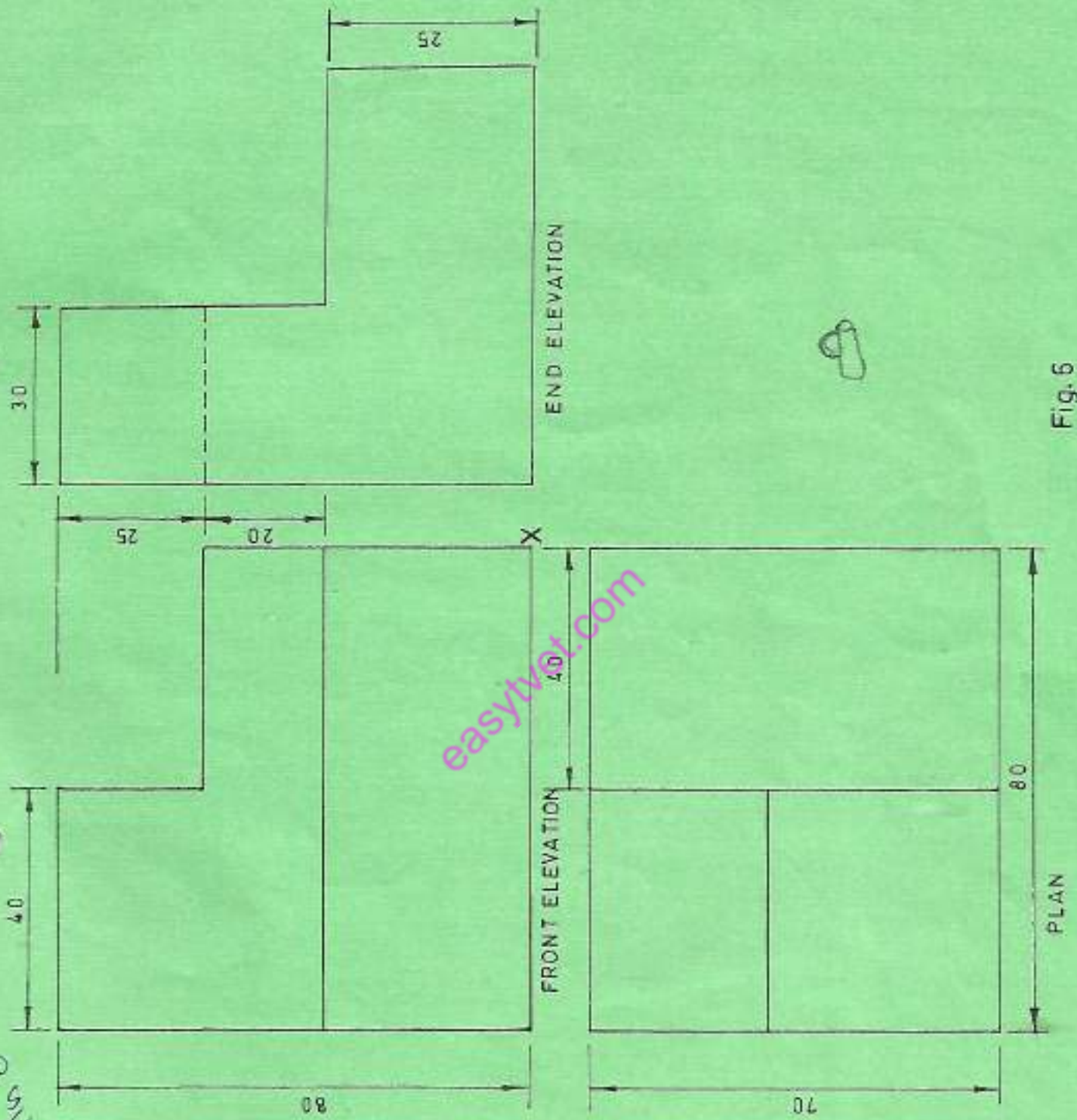


Fig. 6

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