2601/104
2602/104
2603/104
ENGINEERING DRAWING, MATERIALS,
PROCESSES AND WORKSHOP TECHNOLOGY
June/July 2020
Time: 3 Hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING
(POWER OPTION)
(TELECOMMUNICATION OPTION)
(INSTRUMENTATION OPTION)

MODULE I

ENGINEERING DRAWING, MATERIALS, PROCESSES AND WORKSHOP TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
- *Answer booklet;*
- *Drawing instruments;*
- *Drawing papers;*
- *Non-programmable scientific calculator.*

*This paper consists of **TWO** sections; **A** and **B**.*
*Answer any **THREE** questions from section **A** and any **TWO** questions from section **B** in the answer booklet provided.*
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

This paper consists of 5 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

SECTION A: MATERIALS, PROCESSES AND WORKSHOP TECHNOLOGY

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

1. (a) (i) State **three** conditions necessary to keep a fire burning.
(ii) Table 1 shows classes of fires. Complete the table by stating **one** source of fire and **two** extinguishing agents for each class. (9 marks)

Table 1

	Class	Source of fire	Extinguishing agents
1	A		
2	B		

(b) Outline the procedure for mouth-to-mouth resuscitation. (6 marks)

(c) Highlight **five** actions to be taken in case of a fire outbreak. (5 marks)

2. (a) (i) List **six** physical properties of engineering materials.
(ii) State **three** factors that affect the properties of engineering materials. (6 marks)

(b) With the aid of a labeled sketch, describe the production of iron from iron ore, using the blast furnace. (10 marks)

(c) List **four** properties of aluminium that makes it popular in engineering applications. (4 marks)

3. (a) (i) State **three** objectives of marking out;
(ii) Explain the term 'datum with reference to marking out. (5 marks)

(b) Illustrate the use of a vernier caliper in taking the following measurements:

(i) internal diameter;
(ii) depth of a blind hole. (6 marks)

(c) (i) State **four** factors that determine the choice of a rivet.
(ii) Outline the procedure for riveting a lap joint. (9 marks)

4. (a) (i) List **four** components of the oxy-acetylene welding equipment.
(ii) Define arc welding. (6 marks)

(b) (i) List **four** types of drilling machines.
(ii) State **three** safety precautions to be observed when drilling. (7 marks)

(c) Illustrate the following types of lathe operations:

(i) parting-off;
(ii) parallel turning. (7 marks)

SECTION B: ENGINEERING DRAWING

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

5. Figure 1 shows a pictorial view of a towing hook. Draw full size, the following views in first angle projection:

(a) a sectional front elevation along cutting plane 'A - A';
(b) an end elevation in the direction of arrow B;
(c) the plan. (20 marks)

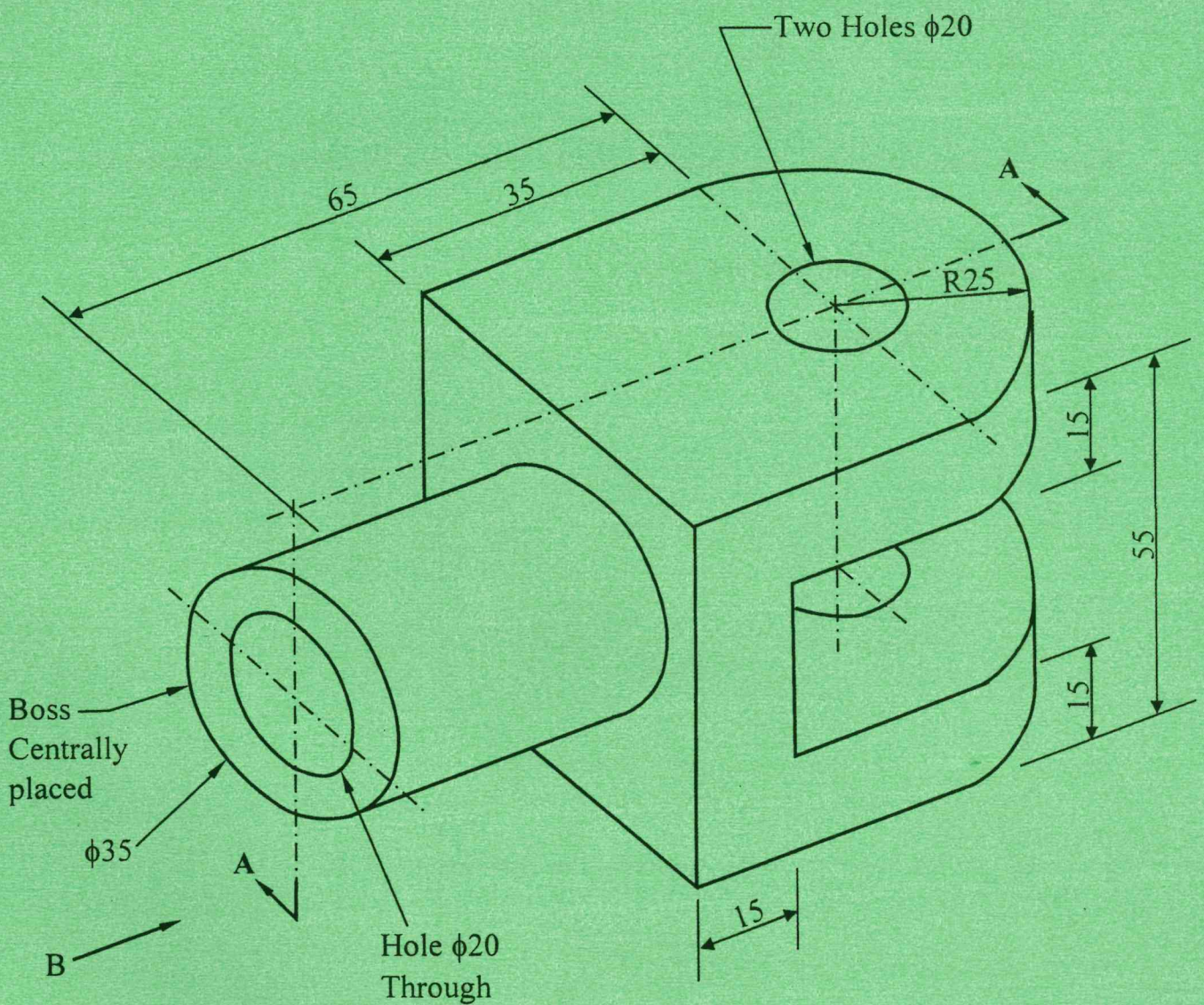

Fig. 1: TOWING HOOK

6. Figure 2, shows front and end elevation of an object. Draw the isometric view of the object with corner 'X' as the lowest point. (20 marks)

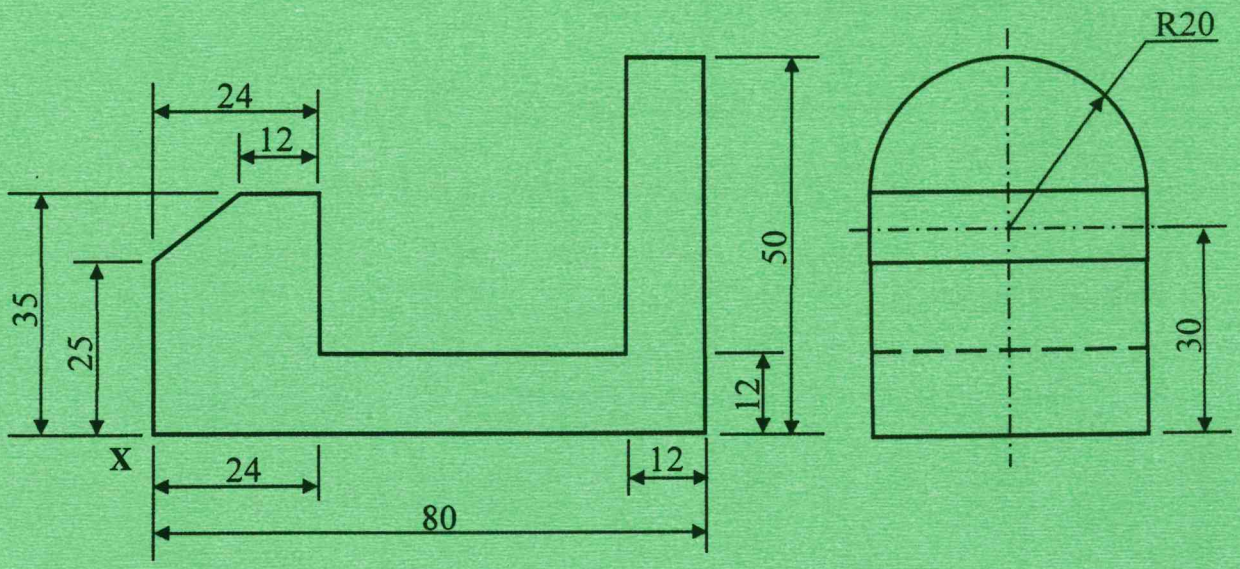

Fig. 2

7. Figure 3 shows an elevation of a truncated cylinder. Draw the given view and construct the following:

(a) end elevation in the direction of arrow 'A'
(b) the plan;
(c) development of the truncated cylinder. (20 marks)

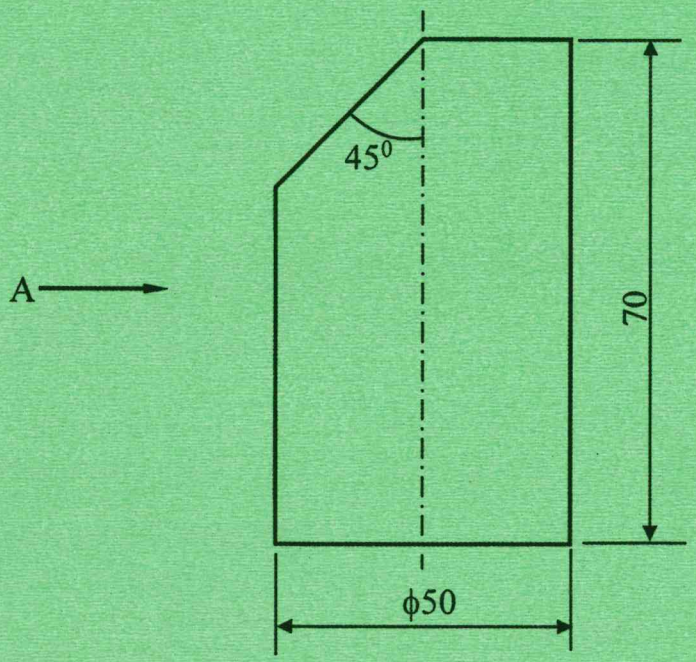

Fig. 3

8. (a) A triangle has sides 70 mm, 90 mm and 40 mm long. Draw the triangle and construct the following:

(i) the inscribed circle;
(ii) the circumscribed circle;
(iii) the smallest escribed circle. (10 marks)

(b) Make free hand sketches of the following:

(i) ball pein hammer;
(ii) angle plate;
(iii) bench vice. (10 marks)

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