

2506/105

2507/105

**WORKSHOP TECHNOLOGY AND**

**LIFE SKILLS**

**June/July 2023**

**Time: 3 hours**



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN AERONAUTICAL ENGINEERING  
(AIRFRAMES AND ENGINES OPTION)  
(AVIONICS OPTION)**

**MODULE I**

**WORKSHOP TECHNOLOGY AND LIFE SKILLS**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Mathematical tables/Non-programmable scientific calculator.*

*This paper consists of EIGHT questions in TWO sections; A and B.*

*Answer question 1 (COMPULSORY) and any other TWO questions from section A.*

*Answer TWO questions from section B.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are as shown.*

*Candidates should answer the questions in English.*

**This paper consists of 4 printed pages.**

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



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**Turn over**

## SECTION A: WORKSHOP TECHNOLOGY

*Answer question ONE (COMPULSORY) any other TWO questions from this section.*

1. (a) List **four** safety precautions that should be observed when using ladders during maintenance of aircraft parts. (4 marks)
- (b) With the aid of sketches, describe the procedure of producing the component shown in Figure 1 from a  $120 \times 120 \times 6$  mm thick metal plate using hand cutting tools. (10 marks)

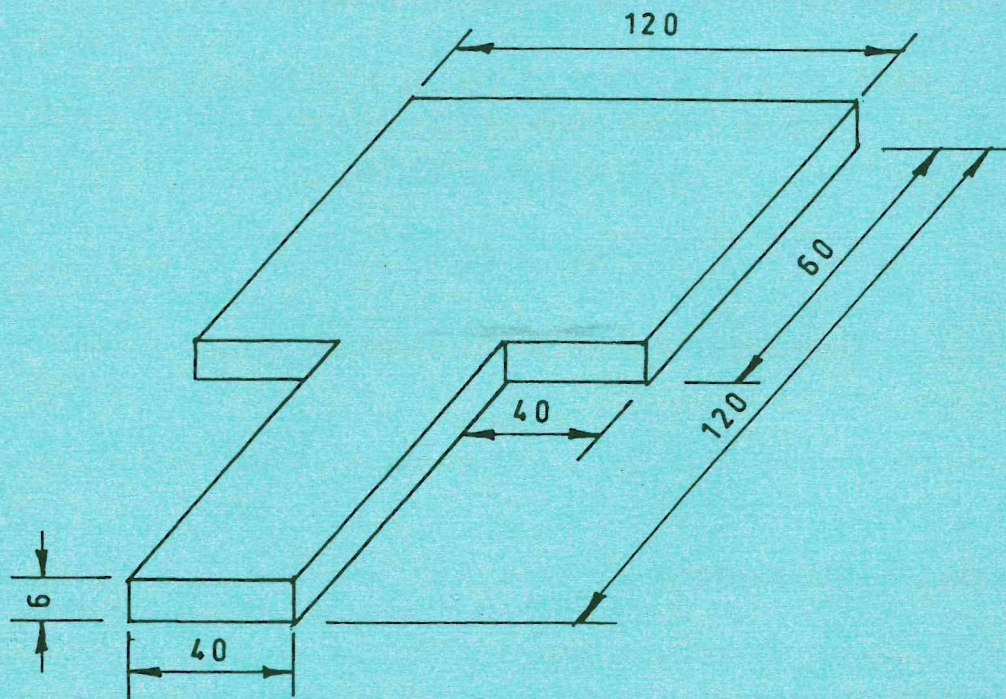


Fig.1

- (c) Illustrate the following metal cutting methods on a lathe machine:
  - (i) orthogonal;
  - (ii) oblique. (6 marks)
2. (a) Outline **four** properties of grey cast iron. (4 marks)
- (b) With respect to heat treatment, differentiate between the following:
  - (i) flame hardening and induction hardening;
  - (ii) full hardening and case hardening. (8 marks)



- (c) Explain each of the following types of aircraft maintenance:
- (i) preventive maintenance;
  - (ii) routine maintenance;
  - (iii) breakdown maintenance;
  - (iv) corrective maintenance. (8 marks)
3. (a) With the aid of sketches, describe each of the following sheet metal operations:
- (i) deep drawing;
  - (ii) raising. (10 marks)
- (b) Illustrate each of the following drilling machine operations:
- (i) tapping;
  - (ii) reaming. (6 marks)
- (c) Outline **four** objectives of quality control in a manufacturing firm. (4 marks)
4. (a) With the aid of sketches, describe the **three** types of Oxy-acetylene gas welding flames. (12 marks)
- (b) List **four** harmful effects of corrosion on aircraft hardware. (4 marks)
- (c) Differentiate between Shaft basis and Hole basis systems in limits and fits. (4 marks)
5. (a) With the aid of sketches, describe the following metal finishing processes:
- (i) super finishing;
  - (ii) buffing. (10 marks)
- (b) Explain the following equipment used for transporting aircraft parts during assembly:
- (i) hand trucks;
  - (ii) flat trolley;
  - (iii) hand pallet trucks. (6 marks)
- (c) Highlight the procedure of riveting two metal pieces together to make a lap joint. (4 marks)

## SECTION B: LIFE SKILLS

*Answer any TWO questions from this section.*

6. (a) An aggressive person exhibits certain characteristics when dealing with others. Outline **four** such characteristics. (4 marks)
- (b) Explain **three** ways in which parents may enhance cordial relationships with their children. (6 marks)
- (c) List **four** features of a person with high emotional intelligence. (4 marks)
- (d) Explain **three** measures that may be taken to curb drugs and substance abuse in the society. (6 marks)
7. (a) Outline **five** habits that may help an individual to avoid problems associated with stress. (5 marks)
- (b) Explain **three** challenges that may be associated with poor time management at the workplace. (6 marks)
- 52 (c) Certain personal factors may hinder the attainment of personal goals. Outline **five** such factors. (5 marks)
- (d) Outline **four** reasons that make empathy an important skill in a relationship. (4 marks)
8. (a) Two people are negotiating over a certain issue. Explain **three** requirements that should be met for such negotiation to be successful. (6 marks)
- (b) List **four** living values that may be associated with the prevention of Human Immunodeficiency Virus (HIV). (4 marks)
- (c) Morrine intends to resolve a certain problem that she is facing. Outline the steps that she should follow to resolve the problem. (5 marks)
- (d) Outline **five** situations that may lead to increased child labour in the society. (5 marks)

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