

2506/105  
2507/105  
**WORKSHOP TECHNOLOGY AND  
LIFE SKILLS**  
Oct./Nov. 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 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.**

**SECTION A: WORKSHOP TECHNOLOGY (60 marks)**

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

1. (a) (i) List **four** causes of corrosion in metals.
- (ii) Highlight **four** methods of preventing corrosion in metals. (4 marks)
- (b) Outline **four** types of metals used in sheet metal work. (2 marks)
- (c) List **two** advantages of each of the following non-destructive testing (NDT) methods:
- (i) magnetic particle flaw detector;
- (ii) ultrasonic flaw detector;
- (iii) visual inspection. (6 marks)
- (d) Illustrate each of the following types of gas welding flames:
- (i) oxidizing;
- (ii) neutral;
- (iii) carburizing. (6 marks)
- (e) Outline **two** safety precautions that should be observed when handling fragile materials. (2 marks)
2. (a) Illustrate each of the following milling techniques:
- (i) down milling;
- (ii) up milling. (8 marks)
- (b) Explain each of the following types of maintenance carried out on an aircraft:
- (i) routine maintenance;
- (ii) breakdown maintenance;
- (iii) planned maintenance. (6 marks)

- (c) Describe each of the following heat treatment processes:
- (i) salt bath carburizing;
  - (ii) carburizing in solid media. (6 marks)
3. (a) With the aid of a diagram, explain the oxy-acetylene gas welding principle. (12 marks)
- (b) Illustrate the **fire** triangle. (4 marks)
- (c) Sketch each of the following accessories of an **aircraft**:
- (i) sleeve coupling;
  - (ii) cotter pin. (4 marks)
4. (a) With the aid of sketches, explain each of the following filing techniques:
- (i) cross filing;
  - (ii) draw filing. (8 marks)
- (b) List **three** categories of files used in an aircraft workshop. (3 marks)
- (c) Highlight the procedure of mounting a grinding wheel on a pedestal grinder. (9 marks)
5. (a) List **two** types of lathe chucks. (2 marks)
- (b) Illustrate each of the following marking out tools while in use:
- (i) trammels;
  - (ii) odd-leg callipers;
  - (iii) scribe. (8 marks)

- (c) Figure 1 shows a lathe turning tool. Identify the angles labelled a, b, c, d, e and f.

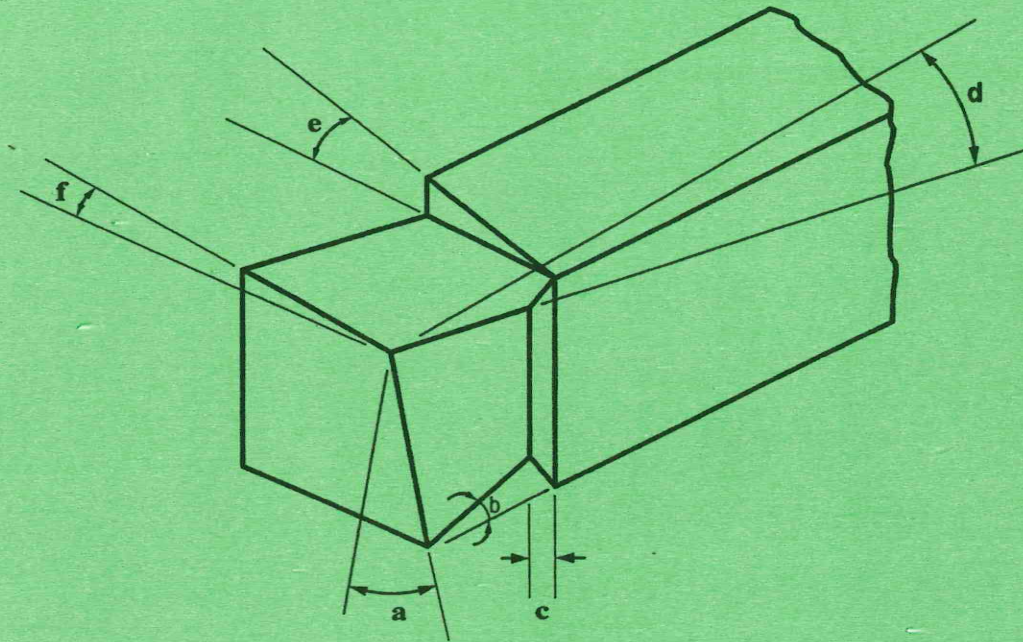


Fig. 1

- (5 marks)
- (d) List **two** functions of cutting fluids. (2 marks)
- (e) Outline **three** factors that determine the marketability of a product. (3 marks)

### SECTION B: LIFE SKILLS (40 marks)

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

6. (a) Outline **four** ways in which life skills education may impact the health sector in a country. (4 marks)
- (b) Explain the way in which a college student may overcome each of the following hindrances to the attainment of personal goals:
- (i) procrastination;
  - (ii) peer pressure.
- (4 marks)

(c) Match each of the following child rights with the appropriate responsibility.

**Child right**

- Quality education
- Quality medical care
- Protection from exploitation and neglect
- Proper nutrition

**Child responsibility**

- Report abuse and exploitation
- Not to waste
- To learn and respect teachers and peers
- Take care of oneself

(4 marks)

(d) Mercy intends to make a decision on which course to pursue. Explain **four** external factors that may influence her decision. (8 marks)

7. (a) List **four** indicators of unhealthy relationships at the workplace. (4 marks)

(b) Outline **three** characteristics of child labour that distinguish it from child work. (6 marks)

(c) Outline **four** situations in the life of an individual that may cause positive stress. (4 marks)

(d) Explain **three** disadvantages of resolving a conflict through a court of law. (6 marks)

8. (a) Distinguish between passive leisure and active leisure, citing **two** examples of activities in each case. (6 marks)

(b) Outline **four** characteristics of an emotionally intelligent person. (4 marks)

(c) Several employees of Benda Airlines are addicted to alcohol. Highlight **four** effects of such addition on the organization. (4 marks)

(d) Two employees are in the process of negotiating over a certain issue. Explain **three** factors that may enhance the success of this process. (6 marks)

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