

**29.21 AVIATION TECHNOLOGY (450)**

29.21.1 Aviation Technology Paper 1 (450/1)

450/1

AVIATION TECHNOLOGY

Paper 1

Oct./Nov. 2008

2½ hours

**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**Kenya Certificate of Secondary Education**

**AVIATION TECHNOLOGY**

**Paper 1**

2½ hours

**Instructions to Candidates**

*Candidates should have the following materials for this examination:*

*Answer booklet*

*Drawing instruments*

*Drawing paper size A3.*

**SECTION A:** *Answer all the questions.*

**SECTION B:** *Answer **Question 11** and any other **three** questions.*

*All dimensions are in millimetres unless otherwise stated.*

**This paper consists of 5 printed pages.**

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

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**SECTION A: (40 marks)**

*Answer All the questions in this section.*

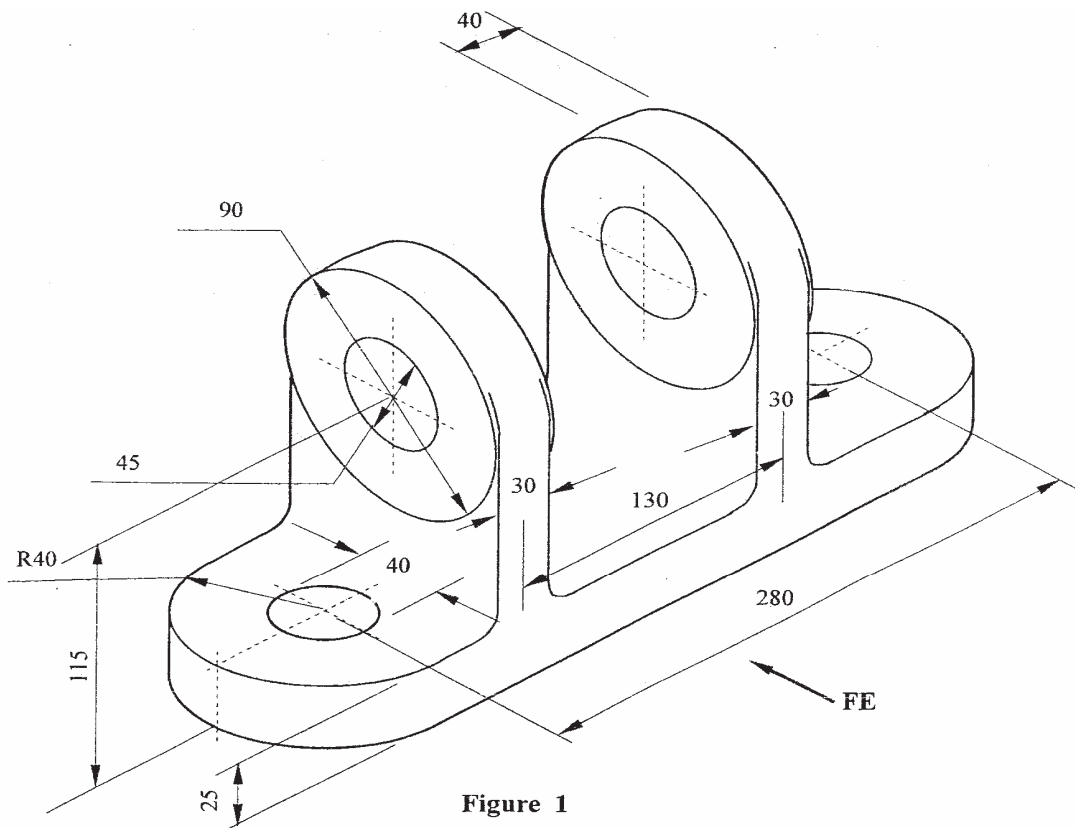
- 1 (a) Give **three** reasons for using retractable landing gear safety micro-switches. (1½ marks)
- (b) Explain the meaning of the following communication messages:
- (i) TOWER THIS IS FIVE YANKEE ZULU BRAVO TANGO READY FOR TAKE OFF.
- (ii) ROGER FIVE YANKEE ZULU BRAVO TANGO PROCEED ON RUNWAY ONE NINER RIGHT. (2 marks)
- 2 (a) Name the **two** types of batteries used in aircraft electrical systems. (1 mark)
- (b) State **three** main functions of battery in an aircraft electrical systems. (3 marks)
- 3 (a) State **one** reason why a pilot should be informed about the weather under each of the following headings:
- (i) visibility during landing;
- (ii) flight planning. (2 marks)
- (b) Define the following terms as applied to aviation:
- (i) wind;
- (ii) cloud. (1 mark)
- 4 Explain the following types of aircraft drag and state how each can be minimised:
- (a) skin friction;
- (b) form drag. (4 marks)
- 5 Outline **four** reasons for heat-treating plain carbon steel. (4 marks)
- 6 Describe the **three** main components in a simple aircraft jet engine. (4½ marks)
- 7 With the aid of a labelled sketch, describe the semimonocoque aircraft fuselage construction. (5 marks)
- 8 (a) State the function of each of the following components in an aircraft hydraulic system:
- (i) actuating cylinder;
- (ii) selector valve. (2 marks)
- (b) Explain the operation of single acting hydraulic hand pump. (2 marks)

- 9 (a) State **four** requirements of aircraft hardware as compared to ordinary hardware. (2 marks)
- (b) List all the information contained in the manufacturer's specifications on aircraft hardware. (2 marks)
- 10 Outline **four** critical information conveyed by a technical drawing. (4 marks)

**SECTION B: (60 marks)**

Answer **question 11** and any other **three** questions from this section.  
Candidates are advised to spend **not more than 25 minutes** in this question.

- 11 Figure 1 shows an isometric view of an aircraft engine mounting bracket. Draw, half size in third angle projection, the following:
- (a) Front elevation in the direction of the arrow. (15 marks)
- (b) Plan.



- 12 (a) With the aid of a labelled sketch define the three aircraft propeller blade angles when the engine is running. (5 marks)
- (b) Explain the operation of an aircraft propeller. (6 marks)
- (c) Explain the difference in operation between fine pitch and coarse pitch in a two-speed propeller. (4 marks)
- 13 (a) Describe aircraft dynamic stability. (3 marks)
- (b) With the aid of a labelled sketch, explain how aircraft stability can be expressed. (6 marks)
- (c) With the aid of graphs, explain the degrees of aircraft dynamic stability. (6 marks)
- 14 (a) Outline the procedure of repainting an aircraft. (7 marks)
- (b) Explain **two** ways in which each of the following factors can cause an accident in aviation industry:
- (i) technical defect;
  - (ii) weather;
  - (iii) servicing error;
  - (iv) pilot error. (8 marks)
- 15 (a) Explain the function of each of the following aircraft systems:
- (i) oxygen;
  - (ii) air-conditioning;
  - (iii) aircraft pressurization ; (5 marks)
  - (iv) radar;
  - (v) communication;
- (b) Name **five** navigational instruments and explain how each instrument can aid the pilot to fly and land at night. (10 marks)