

29.21.2 Aviation Technology Paper 2 (450/2)

Name Index Number/.....

450/2
AVIATION TECHNOLOGY
Paper 2
(PRACTICAL)
Oct./Nov. 2008
2½ hours

Candidate's Signature.....

Date.....

THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
AVIATION TECHNOLOGY
Paper 2
(PRACTICAL)
2½ hours

Instructions to candidates

Write your name and index number in the spaces provided at the top of this page.
Sign and write the date of examination in the spaces provided above.
There are TEN stations in this examination.
Candidates are allowed 15 minutes at each station.
At each station, candidates are not allowed to either review the previous station's work or read instructions for the other stations.
Attempt ALL exercises in each station.
All dimensions are in millimetres unless otherwise stated.

For Examiner's Use Only

Stations	1	2	3	4	5	6	7	8	9	10	TOTAL
Marks											

This paper consists of 13 printed pages.

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

STATION 1

INSTRUCTIONS

Figure 1 shows an assembly of an aeropiston engine component. On the drawing paper provided tabulate appropriately a complete parts list of all the breakdown spares of the assembly. (10 marks)

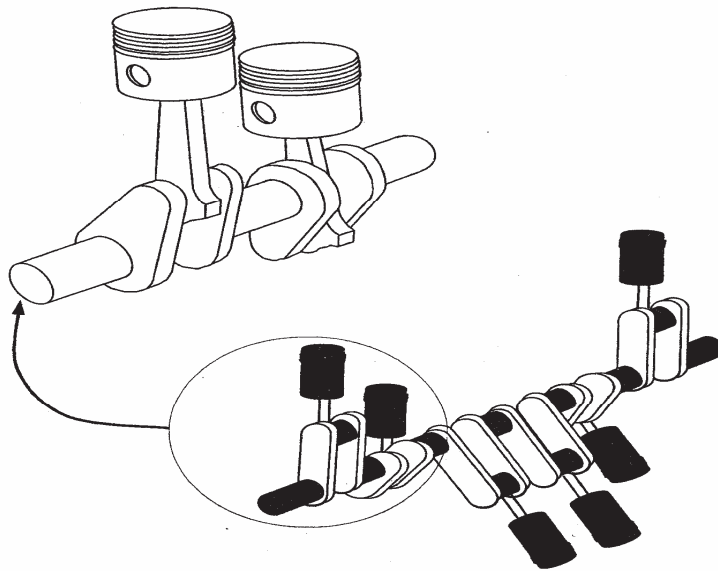


Figure 1

STATION 2

INSTRUCTIONS:

Using the tools, equipment and materials provided, make the aircraft undercarriage bracket as shown in figure 2. (10 marks)

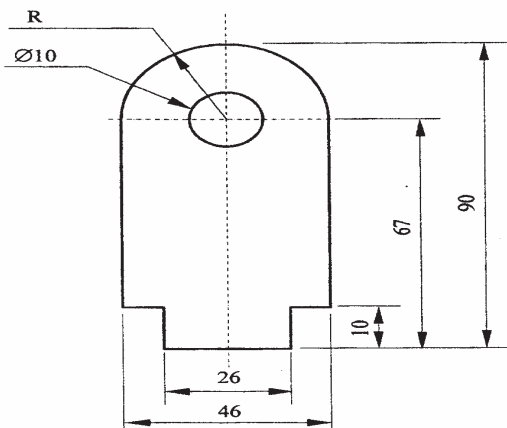


Figure 2

STATION 3

(a) Study the weather photographs labelled **D**, **E** and **F** and complete the table below:

PHOTOGRAPH	WEATHER CONDITION	CAUSE OF CONDITION	HAZARD IN FLIGHT
D			
E			
F			

(4½ marks)

(b) Using the materials provided, do the following:

- (i) Fix the feather tightly at one end of the straw provided. Find the balancing point of the feather assembly and insert the pin provided through this point with the feather blade in vertical position. By the pin, place the assembly at the top of the stand marked S. Let the examiner check your work. (2 marks)
- (ii) Blow the assembly several times from the free end of the straw and state what happens. (1 mark)
- (iii) Relate the experiment to an instrument in aviation industry and state where it is used. (1½ marks)
- (iv) State the significance of the instrument in aviation. (1 mark)

STATION 4

INSTRUCTIONS:

Using the tools and materials provided, perform the following tasks:

(a) For the aircraft cable, determine and record the:

- (i) type
- (ii) specific area of use
- (iii) material
- (iv) size.

(2 marks)

(b) Crimp the female connector provided on one end of the electrical cable and soft solder the male connector on the other end of the cable.

Let the examiner check your work.

(8 marks)

STATION 5

INSTRUCTIONS:

Using the tools and aircraft parts provided, carry out the following tasks:

- (a) (i) Identify the parts **G**, **H** and **J**.

G

H

J

- (ii) State the aircraft system where the components are used. (2 marks)

- (b) (i) Take and record the inside diameters at 20mm from each end of the part labelled **G**.

- (ii) Determine the condition of **G** from the results in (b) (i) above. (4 marks)

- (c) Check and record the size of the gaps in parts labelled **H** and **J**. (2 marks)

H

J

- (d) Record the effects on aircraft performance if the gaps in (c) above are too large or too small.

GAP	TOO LARGE	TOO SMALL
H
J

(2 marks)

STATION 6

INSTRUCTIONS:

- (a) Examine the parts labelled **M** and **N**, name each part and state one defect on each part:

PART	NAME	DEFECT
M
N

(3 marks)

- (b) Study the component labelled **P**.

- (i) name the component

(ii) name the parts painted:

red

blue

black

green

brown

(iii) State **two** systems where the component is used in an aircraft. (4 marks)

(c) Study the aircraft part marked **R** and do the following:

(i) sketch and label the constructional layers;

(ii) state **one** common defect which can be found on component **R**. (3 marks)

STATION 7

INSTRUCTIONS:

- (a) Using the tools and materials provided, cut out and label the cross-section of the two types of aerofoils. (6 marks)
- (b) On the cut-out cross sections, indicate the difference between the two aerofoils. (2 marks)
Let the examiner check your work.
- (c) State **two** applications of each aerofoil in aircraft design. (2 marks)

STATION 8

INSTRUCTIONS:

Using the items and materials provided carry out the following tasks:

- (a) (i) Stroke the item labelled **K** with one end of **J** along the entire length and in one direction several times.
Move **K** towards **M** and record your observations.
- (ii) Repeat (a) (i) above with the item marked **L**. Move **L** towards **M** and record your observations.
- (iii) State the reason behind your observations in (a) (i) and (ii) above. (3 marks)

- (b) (i) Suspend **J** horizontally on the retort stand provided and record your observations.
- (ii) Attach the material labelled **P** at each end of **J** and place it in the plastic basin marked **Q**. Record your observations
- (iii) Remove the assembly from basin **Q** and place it in the basin marked **R**. Record your observations.
- (iv) Dismantle the assembly and hold **J** at one end and dip the other in the bowl marked **S**. Record your observations. (4 marks)
- (c) Relate the experiments in (a) and (b) above to **two** aircraft systems. (1 mark)
- (d) Identify **two** maintenance aspects for the system in (c) above. (2 marks)

STATION 9

INSTRUCTIONS:

- (a) On the aircraft bolt provided;
 - (i) Take and record the following:
 - length
 - diameter
 - distance across flats
 - thread pitch
 - (ii) Determine the following:
 - method of locking
 - material
 - types of thread
 - size of spanner used

(4 marks)
- (b) Take and record the following measurements of the aircraft hydraulic tappet cap:
 - (i) inside diameter
 - (ii) depth.

(2 marks)

(c) Identify **two** rejection criteria of the aircraft nut provided. (1 mark)

(d) Study the aircraft parts labelled **X, Y** and **Z** and complete the table below:

ITEM	NAME	MAINTANANCE CHECK REQUIRED
X		
Y		
Z		

(3 marks)

STATION 10

INSTRUCTIONS:

(a) Study the set up provided and carry out the following:

(i) Record the reading of the spring balance without load.

Reading

(ii) Hook the spring balance to the set up and select switch 1 to ON position. State what happens and record the reading of the spring balance.

Observation.....

Reading

(iii) Select switch 2 to ON position. State what happens and record the reading of the spring balance.

Observation.....

Reading

(iv) Select switch 3 to ON position. State what happens and record the reading of the spring balance.

Observation.....

Reading

(3½ marks)

(b) State the reasons behind the observations in (a) above.

Reasons:

(c) State the law and principle behind your observations.

Law

Principle

(2 marks)

(d) Identify one aircraft system which utilizes this principle.

.....($\frac{1}{2}$ mark)

(e) Relate your observations at each switch position in (a) above to an aircraft operation.

Position 0

1

2

3

(2 marks)