# BUNAMFAN CLUSTER EXAMINATION - 2022

**Kenya Certificate of Secondary Education**

## 450/2 – AVIATION TECHNOLOGY(PRACTICAL) – Paper 2

## June 2022 - 2 ½ hours

**Name**……**Adm No**……

**Class**…… **Date**……

**INSTRUCTIONS TO CANDIDATES**

There are **TEN** stations in this examination.
Candidates are allowed **15 MINUTES** at each station.
Candidates are **NOT** allowed to either review the previous station's work or read instructions for other stations.
Write your **NAME** and **INDEX NUMBER** on all projects.
Attempt **ALL** exercises in each station.
All dimensions are in millimeters unless otherwise stated



**For Examiner's Use Only**

| **Questions** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | **TOTAL** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Marks** | | | | | | | | | | | |

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

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

## STATION 1

**INSTRUCTIONS**

The figure below shows parts of a valve operating mechanism of aeropiston engine. On the drawing paper provided:

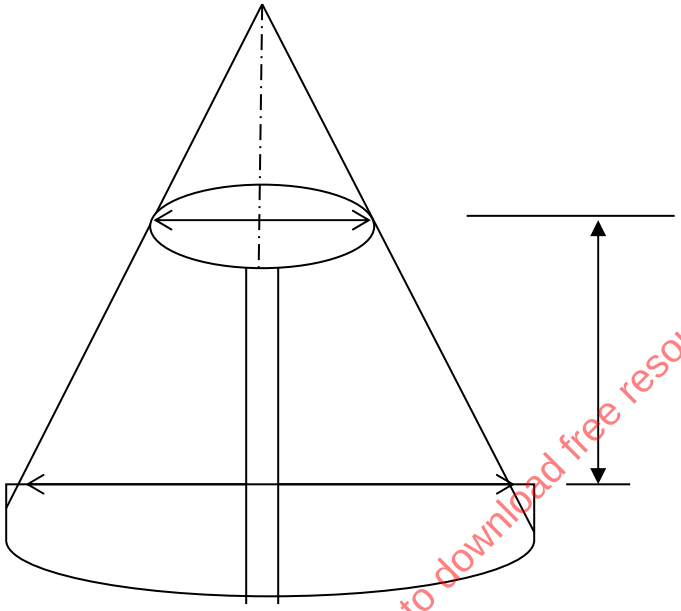
(a) Sketch in good proportion an assembled unit vertically.

(b) Name at least **FIVE** parts on the assembled units. [10 marks]

## STATION 2

**INSTRUCTIONS**

Using the tools, equipment and material provides, make the exhaust Cone as shown in the drawing below. [10 marks]



## STATION 3

**INSTRUCTIONS**

Identify each of the aircraft hardware numbered and state one use for each. [10 marks]

| | **HARDWARE** | **USE** |
|---|---|---|
| 1. | _____ | _____ |
| 2. | _____ | _____ |
| 3. | _____ | _____ |
| 4. | _____ | _____ |
| 5. | _____ | _____ |

## STATION 4

**INSTRUCTIONS**

Study the two aircraft models carefully and answer the questions that follow:-

(a) Classify the two types of aircraft represented by the models and in each case give an example of such an aircraft. [4 marks]

| MODEL | TYPE | EXAMPLE OF REAL AIRCRAFT |
|---|---|---|
| A | | |
| B | | |

(b) State the operational difference of the two types of aircraft with regards to the following:- [4marks]

(i) Landing

A …….

B ……..

(ii) Take-off

A ……...

B ……..

(iii) Parking Configuration

A ……..

B ……..

(iv) Main undercarriage

A ……

B ……

(c) Explain why design A is not commonly used. [2 marks]

…….

……

……

……



**Turn over**

## STATION 5

**INSTRUCTIONS**

(a) Place the spring provided between the vice jaws endwise.
Tighten the vice and observe what happens to the spring.

(i) State the type of load the spring is subjected to:

……

……

(ii) State the loading effect on the spring.

……

……

(iii) Relate this loading to an aircraft structure. [4 marks]

……

……

(b) Clamp the marked end of the metal plate provided between the vice jaws. Push the plate at the point marked **A** and observe what happens.

(i) State the two types of load the metal plate is subjected to.

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(ii) State the loading effect on the metal plate.

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(iii) Relate these loadings to aircraft primary control surface. [6 marks]

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## STATION 6

**INSTRUCTIONS**

(a) Roll the ball from the bottom of the concave surface of the basin provided.

(i) State what happens to the ball. [1 mark]

……..

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(ii) Explain the relevance of this experiment to an aeroplane in flight. [2 marks]

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……..

(b) Roll the ball from the top of the convex surface of the basin

(i) State what happens to the ball. [1mark]

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……..

(ii) Explain the relevance of the experiment to an aeroplane in flight. [2 marks]

……

……

(c) Roll the ball on the flat surface provided (table)

(i) State what happens to the ball. [1 mark]

……

……

(ii) Explain the relevance of this experiment to an aeroplane in flight. [2 marks]

……

……

(d) State which of the above situations (a), (b) and (c) is best suited for an aeroplane in flight. [1 mark]

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## STATION 7

**INSTRUCTIONS**

(a) Replace the turn buckle provided and wire lock. Let the examiner check your work.

(b) Name the tool (s) suitable for use the exercise. [10 marks]

## STATION 8

**INSTRUCTIONS**

Connect the components provided as shown in the circuit diagram below. Let the examiner check your work. [4 ½ marks]



(a) Select switch $S_1$ to the ON position and measure the value of the current flowing through bulb B,

Current: _____ [1 mark]

(b) With switch $S_1$ in OFF position, measure the value of resistor $R_1$. [1 mark]

_____

(c ) Select switch $S_1$ and $S_2$ to the ON position and explain what happens to bulbs $B_1$ and $B_2$.

_____

_____

[2 marks]

(d) Measure the total circuit resistance.

_____

[1 mark]

(e) State one application of the circuit in an aircraft. [½ mark]

_____

_____

## STATION 9

**INSTRUCTIONS**

- Mask the paper on the table in horizontal position.
  Let it flap down on the other end.
- Blow air over the paper.

(a) Make your observation [2 marks]

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(b) State the principle behind this experiment. [2 marks]

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(c) Relate the principle (b) above to an aircraft.

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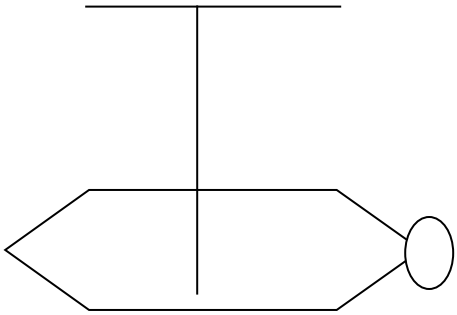
[6 marks]

## STATION 10

**INSTRUCTIONS**

Study the set up below and answer the questions that follow:



(a) (i) State the observation made before and after the fire cracker is lit.
Observation:-
Before ……..

After……..
[2 marks]

(ii) State the scientific law that is associated with the observation made in a (i) above.
[2 marks]
…….

(b) (i) State why the experiment can only be successful in the innermost and not in the outer space. [1 mark]

……..

(ii) Name a type of an aircraft that has a mechanism to overcome the condition in b (i) above.
[1 mark]
……

(c) Outline two safety measures you would take to ensure the experiment is successful. [2 marks]

(i) …….

(ii) …….

(d) What is the relevance of this experiment in aviation? [2 marks]

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