

3.8 AVIATION TECHNOLOGY (450)

The 2014 KCSE examination for Aviation Technology consisted of two papers namely Paper 1 (Theory) and Paper 2 (Practical). The theory was worth 60% while practical was worth 40% of the final mark. The format and weighting of the two papers was the same as in the previous years.

Candidates General Performance

The table below shows candidates' overall performance for the last six years:

Table 16: Candidates' Overall Performance in Aviation Technology from 2009 to 2014

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2009	1	68	60	34.84	6.17
	2		40	26.24	3.97
	Overall		100	61.07	9.09
2010	1	52	60	37.76	6.62
	2		40	27.21	2.94
	Overall		100	63.52	11.1
2011	1	70	60	35.49	6.51
	2		40	26.16	3.04
	Overall		100	61.26	9.05
2012	1	118	60	34.82	6.63
	2		40	25.08	4.13
	Overall		100	59.90	9.87
2013	1	158	60	33.39	8.24
	2		40	24.94	3.57
	Overall		100	58.33	10.76
2014	1	160	60	31.98	9.03
	2		40	20.59	4.92
	Overall		100	52.58	13.32

From the table above, the following observations can be made:

- (i) The candidature increased slightly from **158** in 2013 to **160** in 2014.
- (ii) The mean score dropped from **58.33** in 2013 to **52.58** in 2014.
- (iii) However the standard deviation improved from **10.76** in 2013 to **13.32** in 2014.

3.8.1 Aviation Technology Paper 1 (450/1)

The questions which were reported to have been poorly responded have been analyzed with a view to pointing out candidates' weaknesses and propose suggestions on some remedial measures that need to be taken in order to improve performance in future. The questions for discussions include 4, 5, 6, 7, 8, 11 and 14.

Question 2

Outline **three** roles of aircraft dispatchers.

(3 marks)

Weakness

Most candidates could not outline the roles of aircraft dispatchers.

Advices to teachers

Teachers need to organize for trips to take students to airports and airfields for them to understand the roles played by aircraft dispatchers.

Expected response

- (i) Schedule flights.
- (ii) Ensure all civil aviation regulations are adhered to.
- (iii) Flight plans.
- (iv) Supply meteorological reports.
- (v) Briefing the flight crew.

Question 8 a

Outline the meaning of each of the four range colour markings on aircraft instruments.

(4 marks)

Weakness

Most candidates could not outline the meaning of the four range colour markings on instruments while others confused the meanings

Advice to Teachers

They should teach the whole syllabus without making any assumptions

Expected response

- (i) Red radical line - indicates maximum and minimum operating ranges.
- (ii) Blue arc - indicates that operation is permitted under certain conditions.
- (iii) Green arc - indicates the normal operating range.
- (iv) Yellow arc - indicates caution operating range.
- (v) White arc - indicates the alignment of the glass and instruments.

Question 9 a

Explain how each of the following tools are used during fabrication of aircraft parts.

- (i) Bucking bars;
- (ii) Countersink bit.

Weakness

Most candidates could not answer the question.

Advice to Teachers

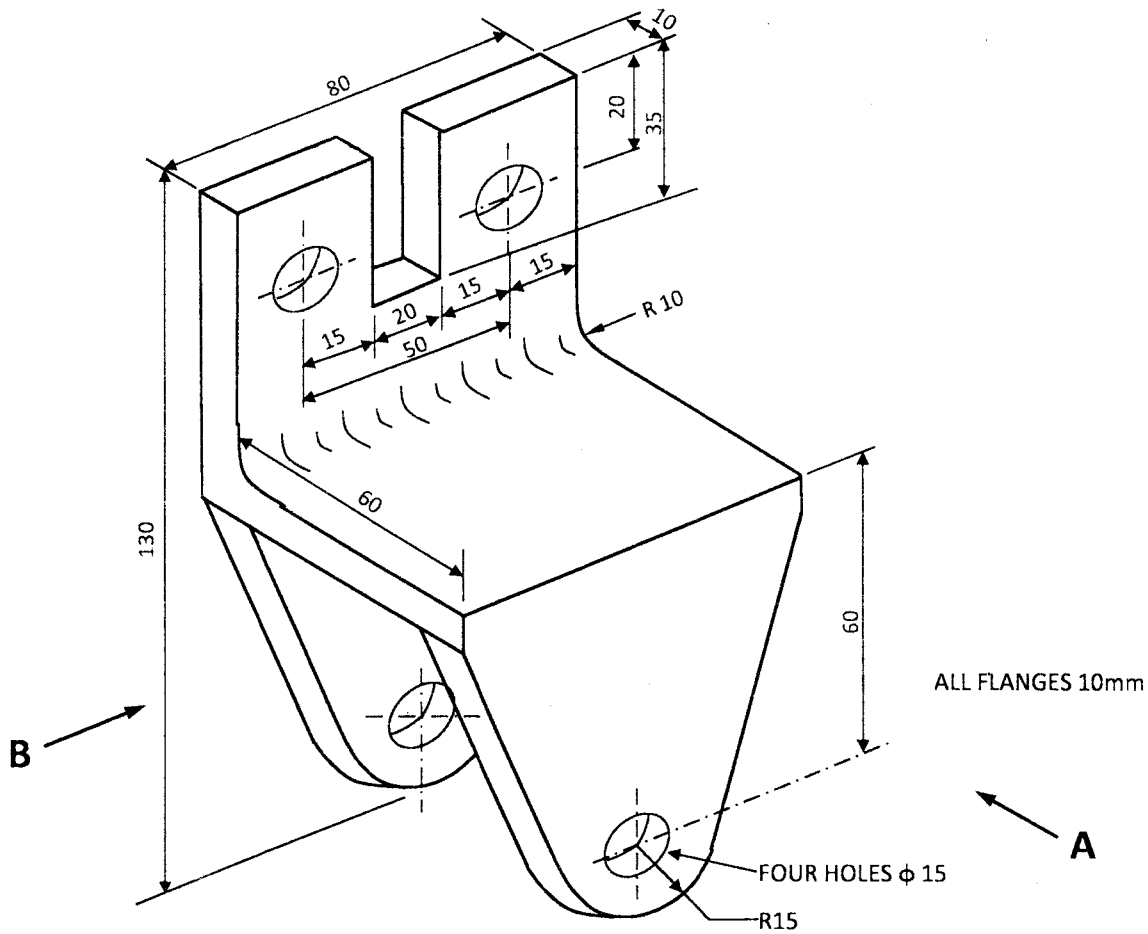
They should teach and emphasise the tools used for each task in the aviation industry.

Expected response

- (i) Bucking bar - a tool held against the shank end of a rivet while the snap head is being formed.
- (ii) Countersunk bit - a tool which cuts a cone shaped depression around a rivet hole to allow the rivet to set flush with the surface of the skin.

Question 11

The figure below shows an isometric drawing of an aircraft hinge bracket.



Draw **FULL SIZE** in Third Angle projection the following views (Use A3 paper provided):

- (a) front elevation in the direction of arrow A;
- (b) end elevation in the direction of arrow B;
- (c) plan.

(14 marks)

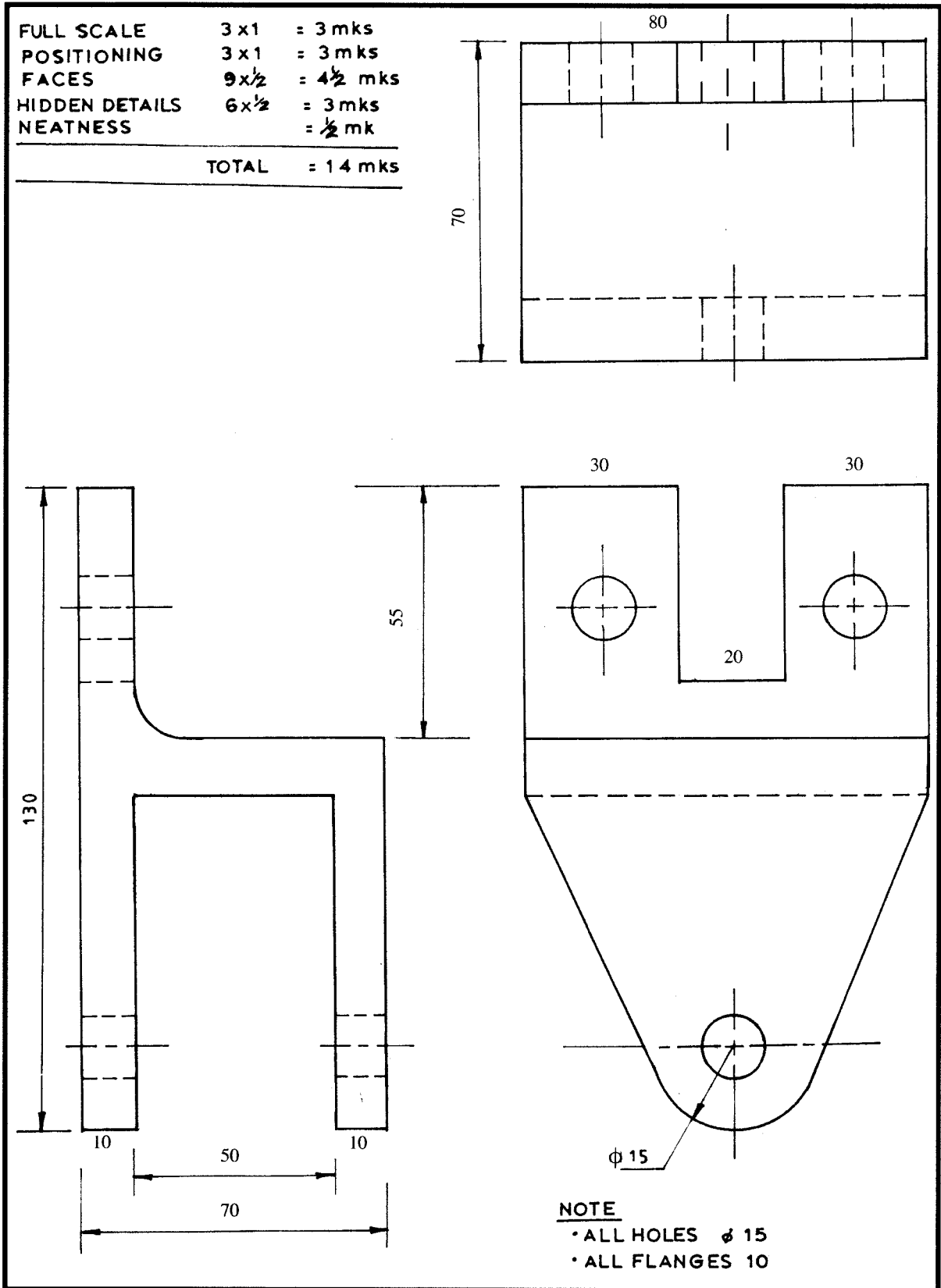
Weakness

Most candidates had problems in interpretation of the faces and representing them in orthographic.

Advice to teachers

Teachers are advised to teach the topic of Related Drawing thoroughly and give students a lot of exercises to perfect the skill in drawing.

Expected response



Question 14 a

Explain **four** functions of aircraft tabs during flight.

(4 marks)

Weakness

Most candidates gave wrong answers.

Advice to teachers

Teachers should source for resource persons to teach more in the areas where they find difficulties.

Expected response

- (i) Trimming purpose.
- (ii) Augment the force required by the pilot.
- (iii) Increase the effort required by the pilot.
- (iv) Fine correction of the selected primary controls position.
- (v) To relief the pilot on repeatative manoeuvre.

3.8.2 Aviation Technology Paper 2 (450/2))

This practical paper comprised 10 equally weighted exercises which were compulsory. The various practical skills tested in this paper included the following:

- Sketching in good proportion a pictorial view of a single disc assembly and naming the parts.
- Fabrication of a n aircraft pane hinge shown in the figure.
- Testing of different materials on their burning capability and hardness
- Identification of an aircraft component, the defects on each component and assembling the component.
- Identification of aircraft fuel system components and stating where each is used.
- Identification of aircraft tyre provided and the defects on the tyre.
- Determination of correct arrangement of the lines of force for a given model of aircraft.
- Studying the scenario as given in the airfield provided then and stating the expected immediate action and reason for the action.
- Connection of two bulbs to be in series then in parallel with a third bulb
- Study of a four stroke engine component provided and stating the material used for their manufacture.

Weaknesses

The overall performance in this paper was above average but some weaknesses were noted in most of the questions as discussed below.

In **station 1** some candidates had problems drawing the pictorial view of the disc assembly as expected.

In **station 2** some candidates could not interpret the details of the hinge thus its non-functionality.

In **Station 3** some candidates could not follow instructions thus ended up with wrong results.

In **station 4** some candidates could not give the major maintenance aspects for the component .

In **station 5** candidates in some centers seemed not to have any idea about the fuel system.

In **station 6** some candidates failed identify tyre defects as labeled for examination purpose.

In **station 7** some candidates seemed to not have any idea on the theory of flight as required.

In **station 8** candidates in a few centers seemed not aware of maneuvers and requirements of each aircraft in the examination paper.

In **station 9** some candidates were not able to connect the components provided as shown in the circuit

ADVICE TO TEACHERS

Teachers should ensure that all the practical aspects in the syllabus are adequately covered without assuming the support topics. The list of tools and equipment at the back of the syllabus should be used as a check list to ascertain that students are familiar with what they are expected to handle during the examination.

Students are expected to know tools, materials and components used in the aviation industry by the correct names. The correct handling of tools, parts, materials etc. should also be emphasized during training.

Students should be proactive in carrying out various experiments, inspecting and evaluating various aircraft components and also in setting and adjusting various parts of an aircraft.

Schools offering the subject are advised to source for aircraft instruments from grounded aircrafts in some airstrips and airports for learning purposes.