**Instructions to candidates**

* Write your name, index number and stream in spaces provided
* Candidates should have the following material for this examination:
	+ Drawing paper
	+ Drawing instruments
* This paper consists of two sections A and B
* Answer all questions in section A and any FOUR questions in section B.
* Question 15 should be answered on A3 paper provided
* All dimensions are in millimeters unless otherwise stated
* Candidates should not spend more than 15minutes on question 15.

**For examiners use only**

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| **SECTION** | **QUESTION** | **MAXIMUM SCORE** | **CANDIDATES SCORE** |
| **A** | **1-10** | **44** |  |
| **B** | **11** | **14** |  |
| **12** | **14** |  |
| **13** | **14** |  |
| **14** | **14** |  |
| **15** | **14** |  |
| **TOTAL** | **100** |  |

**SECTION A (44Marks)**

1. Highlight TWO roles of each of the following personnel’s:
2. Directorate of civil aviation. (1mark)

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1. Ram coordinator. (1mark)

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1. (a) State TWO safety precautions to be observed when working on an aircraft engine.

(2marks)

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(b) Highlight TWO checks to be done on a foam fire extinguishing cylinder.(2marks)

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1. (a) By use of sketches illustrate the two principles employed in thrust force generation.

(2marks)

(b) Differentiate between the following types of drag:

(i) Skin friction and form drag. (1mark)

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(ii) Interference and induced drag. (1mark)

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1. (a) Highlight four ISA conditions giving their respective SI units. (2marks)

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(b) With the aid of a well labeled diagram show the effect of altitude to temperature and pressure at different atmospheric layers. (2marks)

1. (a) Name TWO ways in which airports are classified giving each one example.(2marks)

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(b) Highlight TWO safety practices laid when using a tow bar. (2marks)

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1. (a) Briefly explain with the aid of a sketch how propeller type engine operates.(2marks)

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(b) Illustrate the cylinder assembly system stating the function of three labeled parts.

(3marks)

1. (a) Name TWO bodies accredited to manufacture standard aircraft hardware. (1mark)

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(b) State TWO reasons why threaded fasteners are preferred for use on an aircraft.

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(c) Sketch the following aircraft hardware’s:

(I) locking plate (1mark)

(ii) Clevis bolt (1mark)

1. (a) Name TWO types of rescue equipment that should be carried on an aircraft flying on a bare land. (1mark)

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(b) Highlight two checks to be done on a life jacket. (2marks)

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(c) Explain the function of the equipment named in part 8(a) (1mark)

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1. (a) List TWO methods used for joining metal parts in aircraft construction. (1mark)

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(b) Differentiate between:

(i) Strength and conductivity (1mark)

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(ii) Magnetism and elasticity (1mark)

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(c) Explain case hardening as applied in heat treatment processes. (1mark)

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1. In good proportion sketch the following bracket in third angle projection indicating three major dimensions in space below. (5marks)



**SECTION B (56Marks)**

1. (a) outline TWO ways of steering the aircraft in the following conditions:
2. In flight (2marks)

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1. On ground (during flight) (2marks)

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(b) With the aid of a labeled sketch explain how elevators are controlled from the cockpit. (6marks)

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(c) Explain the function of the following types of flaps with the aid of sketches:

(i) Leading edge. (2marks)

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(ii) trailing edge (2marks)

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1. (a) Define fire ordering as applied to propulsion. (1mark)

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(b) State two differences between normal aspirated induction system and turbocharger induction system. (2marks)

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(c) With the aid of a well labeled diagram describe a simple hydraulic system. (8marks)

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(d) Highlight four functions of accumulator (4marks)

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1. (a)Explain the importance of the following factors in an organization :
2. Good communication (2marks)

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1. Motivation to workers (2marks)

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(b) Describe the following factors that affect personnel performance:

(i) Culture (1mark)

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(ii) Workload (1mark)

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1. Interpersonal relationship (1mark)

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1. Insecurity (1mark)

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(c) Explain how the following factors affect aviation policies

(i) Government policies (2marks)

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(ii) Natural pandemics (2marks)

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1. Hotel industry (2marks)

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1. (a) State the importance of flight planning. (1mark)

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(b) Write the following in full:

i). VHF (1mark)

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ii). NDB (1mark)

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(c) Describe the following Q code altimeter settings:

(i) QNH (2marks)

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(ii) QNE (2marks)

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1. QFE (2marks)

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(d) Explain the function of the following navigational aids:

(I) Radio magnetic indicator (2 ½ marks)

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(ii) Radar (2 ½ marks)

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1. Figure 2 shows an aircraft hinge bracket drawn in isometric projection. Draw full scale in third angle projection the following views:
2. Front elevation in the direction of the arrow
3. End elevation
4. Plan

(Use the A3 or A4 paper provided) (14marks)

Fig.2

  F.E