THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING AVIONICS (COMMUNICATION AND NAVIGATION OPTION)

AIRFIELD AND SAFETY PROCEDURES

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;
Drawing Instruments.

*Answer any **FIVE** of the following **EIGHT** questions.*
All questions carry equal marks.
Maximum marks for each part of a question are indicated.

This paper consists of 3 printed pages.

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

1. (a) Explain each of the **three** safety aspects enhanced by aircraft ground/flight mode when the aircraft is on the ground. (6 marks)

(b) Describe each of the following protection devices applied in aircraft electrical circuits:

(i) circuit breakers;
(ii) limiting resistors;
(iii) fuses. (6 marks)

(c) With the aid of sketches, compare the principle of operation of an aircraft alternator and starter motor. (8 marks)

2. (a) Outline any **five** roles of Air Traffic Controller in accordance to International Civil Aviation Organization (ICAO). (5 marks)

(b) Outline the **five** priviledges of international flight in accordance to the ICAO requirements. (5 marks)

(c) Use a schematic diagram to show aircraft maintenance layout according to Kenya Civil Aviation Authority. (10 marks)

3. (a) Describe each of the **three** methods of checking water contamination in an aircraft fuel tank. (6 marks)

(b) With the aid of sketches, explain each of the following methods used in checking aircraft fuel quantity:

(i) float resistor;
(ii) drip stick;
(iii) magnetic stick.

(6 marks)

(c) Explain **four** safety precautions observed during aircraft pressure refuelling or defuellling. (8 marks)

4. Discuss **ten** potential factors which can lead to an aircraft accident. (20 marks)

5. (a) Outline **six** general features and operational capabilities of aircraft fire warning and protection systems. (6 marks)

(b) With the aid of sketches, describe each of the following fire detection systems:

(i) thermal switch;
(ii) continuous element sensing loop;
(iii) thermo couple. (6 marks)

(c) Explain each of the **four** identification markings on aircraft fire extinguishing agent containers. (8 marks)

6. (a) Outline **five** factors that determine the protection level of an aircraft component during initial provisioning. (5 marks)

(b) Discuss the following terms as applicable to handling of aircraft wheels:

(i) manufacturers specifications;

(ii) storage conditions. (10 marks)

(c) List **five** advantages of decentralised over centralized aircraft technical stores. (5 marks)

7. (a) Discuss the causes of noise in accordance with ICAO laws governing airport regulations and explain how it is measured. (4 marks)

(b) Explain any **three** effects of noise on human beings. (6 marks)

(c) (i) Outline **four** distinct variables of noise.

(ii) Describe any **three** methods used to protect human beings from aircraft noise. (10 marks)

8. (a) Describe the aircraft life raft/dinghy emergency rescue equipment and state when required. (4 marks)

(b) Explain any **three** emergency rescue equipment fitted on the 8 (a) above. (6 marks)

(c) (i) Discuss the function and operation of an aircraft emergency chute.

(ii) Describe each of the following aircraft emergency rescue equipment:

(i) portable CO_2;

(ii) crew oxygen mask;

(iii) axe. (10 marks)