2506/307
AIRFRAME SYSTEMS II AND
AIRFIELD SAFETY III
June/July 2020
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING (AIRFRAMES AND ENGINES OPTION)

MODULE III

AIRFRAME SYSTEMS II AND AIRFIELD SAFETY III

3 hours

INSTRUCTIONS TO CANDIDATES

You should have drawing instruments for this examination.
*This paper consists of **EIGHT** questions in **TWO** sections; **A** and **B**.*
*Answer **THREE** questions from Section **A** and **TWO** questions from Section **B** in the answer booklet provided.*
All questions carry equal marks.
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

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.

Turn over

SECTION A: AIRFRAME SYSTEMS II

*Answer **THREE** questions from this section.*

1. (a) With reference to airworthiness, explain **six** requirements of aircraft controls. (6 marks)

   (b) With the aid of a well labelled sketch, describe the construction and operation of a Q-feel unit. (14 marks)

2. Highlight:

   (a) precautions observed when installing aircraft fuel tanks; (8 marks)

   (b) **six** advantages of aircraft pressure fuelling; (6 marks)

   (c) **six** requirements of a manually operated fuel selector valve. (6 marks)

3. (a) Highlight **six** advantages and **three** disadvantages of using composite material over alloys in aircraft structural construction. (9 marks)

   (b) Describe tap testing method of inspecting composite materials. (5 marks)

   (c) With the aid of a labelled sketch, describe the construction of a sandwich structure. (6 marks)

4. (a) Describe each of the following methods of removing rain on aircraft wind shield:

      (i) wipers;
      (ii) bleed air. (6 marks)

   (b) With the aid of a labelled sketch, describe the construction and operation of ionised radiation smoke detector. (11 marks)

   (c) State **six** methods of aircraft fire detection other than the one in 4(b). (3 marks)

5. With the aid of labelled sketches, describe the construction of each of the following airframe structure on modern transport aircraft:

   (a) cabin floor; (12 marks)

   (b) cabin windows. (8 marks)

SECTION B: AIRFIELD SAFETY PROCEDURES III

*Answer **TWO** questions from this section.*

6. (a) Outline **eight** requirements for aircraft registration in Kenya. (8 marks)

(b) With reference to KCARS, explain the location of registration marks on each of the following aircrafts:

(i) fixed wing;

(ii) rotor craft. (9 marks)

(c) Describe the size of letters and numbers of aircraft registration marks. (3 marks)

7. (a) (i) Define the term accident.

(ii) Discuss what is considered as an aircraft accident. (12 marks)

(b) Outline **eight** potential hazards which aircrash rescue workers may encounter. (8 marks)

8. (a) Outline **eight** characteristics of aircraft rotable inventory. (8 marks)

(b) Explain the **seven** advantages and **five** disadvantages of a maintained inventory in an airline. (12 marks)

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