2506/307
AIRFRAME SYSTEMS II AND
AIRFIELD SAFETY PROCEDURES III
Oct. / Nov. 2022
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING (AIRFRAMES AND ENGINES OPTION)

MODULE III

AIRFRAME SYSTEMS II AND AIRFIELD SAFETY PROCEDURES III

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
Drawing instruments;
Mathematical tables / Non programmable calculators.
*This paper consists of **EIGHT** questions in **TWO** sections; **A** and **B**.*
*Answer **THREE** questions from section **A** and **TWO** questions from section **B**.*
All questions carry equal marks.
Maximum marks for each part of a question are as shown.
Candidates should answer the questions in English.

This paper consists of 4 printed pages.

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

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SECTION A: AIRFRAME SYSTEMS II

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

1. (a) Outline **five** parameters monitored in a typical aircraft water and waste system. (5 marks)

   (b) With the aid of a labelled sketch, show the construction of a typical aircraft lavatory. (6 marks)

   (c) Discuss each of the following principles considered when designing typical aircraft water waste system:

   (i) safety;

   (ii) comfort;

   (iii) maintenance. (9 marks)

2. (a) Discuss each of the following types of aircraft corossion:

   (i) surface;

   (ii) dissimilar metal;

   (iii) intergranular;

   (iv) stress. (12 marks)

   (b) Explain **eight** factors considered when applying a dye-penetrant during non destructive testing. (8 marks)

3. (a) Describe the inspection carried out on a continuous loop sensing element in an aircraft fire protection system. (10 marks)

   (b) With the aid of a labelled sketch, explain the operation of an aircraft pneumatic continuous loop fire detector. (10 marks)

4. With the aid of labelled sketches, describe the operation of each of the following ice detection system:

(a) hot rod;

(b) smiths;

(c) serrated rotor;

(d) vibrating rod.

(20 marks)

5. (a) With the aid of a labelled sketch, describe the constructional requirements of a transonic aircraft flight deck windows. (7 marks)

(b) With the aid of a labelled exploded view sketch, outline the procedure of repairing a damaged pressurized aircraft fuselage. (13 marks)

SECTION B: AIRFIELD, SAFETY PROCEDURES III

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

6. (a) Explain **six** personal protective equipment used during aircraft search and rescue mission. (12 marks)

(b) With reference to KCARs:

(i) highlight **four** objectives of aircraft accident investigation; (4 marks)

(ii) outline the role of an expert appointed by the lead investigator. (4 marks)

7. (a) Explain **four** requirements that should be met by an operator of an aircraft for issuance of certificate of airworthiness. (4 marks)

(b) With reference to aircraft stores procedures, highlight **four**:

(i) sources from which a manager can obtain data on spares acquisition;

(ii) characteristics of expendables.

(8 marks)

(c) Outline **eight** roles of an aircraft maintenance quality assurance engineer. (8 marks)

8. With reference to KCARs, highlight the preventive maintenance carried out in each of the following on an aircraft.

(a) landing gears; (4 marks)

(b) structures; (4 marks)

(c) interiors; (3 marks)

(d) systems. (9 marks)

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