2506/206
AIRFRAME SYSTEMS I
Oct./Nov. 2017
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING (AIRFRAME AND ENGINES OPTION)

MODULE II

AIRFRAMES SYSTEMS I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Drawing instruments;
Mathematical table/Non-programmable Scientific calculator.
*This paper consists of **EIGHT** questions.*
*Answer **FIVE** questions in the answer booklet provided.*
Maximum marks for each part of a question are as shown.
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

1. (a) Define each of the following terms as applied to hydraulic systems:

(i) viscosity;

(ii) chemical stability;

(iii) flash point;

(iv) fire point. (4 marks)

(b) With reference to hydraulic systems:

(i) List **two** main fluid contaminants;

(ii) Explain **three** types of fluids used;

(iii) Outlining the flushing procedure;

(iv) Describe the following sampling schedules:

(I) routine;
(II) unscheduled;
(III) suspicion. (16 marks)

2. (a) Outline **six** checks carried out during landing gear retraction system testing. (6 marks)

(b) With the aid of a sketch, explain the operation of a main gear pin type shock strut. (14 marks)

3. (a) With the aid of a labelled sketch, show the exploded view of an expander brake assembly. (10 marks)

(b) Explain the operation of an aircraft anti-skid system. (10 marks)

4. With reference to aircraft tires:

(a) State the classification; (4 marks)

(b) Describe the following parts:

(i) carcass plies;

(ii) tread;

(iii) side wall;

(iv) chine. (8 marks)

(c) Discuss:

(i) tread depth and wear pattern;

(ii) tread damage. (8 marks)

5. (a) Explain **one** characteristic of each of the three forms of oxygen used in an aircraft. (6 marks)

(b) (i) Explain **two** types of regulators used in demand flow oxygen systems. (4 marks)

(ii) With the aid of a labelled sketch, show the layout of a typical continuous flow oxygen systems. (10 marks)

6. (a) Define the following terms as applied in the aircraft pressurization system:

(i) cabin attitude;

(ii) cabin differential pressure;

(iii) cabin rate of climb. (6 marks)

(b) Describe pressurization modes. (4 marks)

(c) With the aid of a labelled schematic sketch, show the construction of a typical vapour cycle air conditioning machine. (10 marks)

7. (a) State **two** types of batteries used on aircrafts. (2 marks)

(b) Outline **five** battery conditions monitored on an aircraft. (5 marks)

(c) With the aid of a labelled diagram of a DC generator:

(i) show the main parts;

(ii) state **five** areas of inspection. (13 marks)

8. (a) State **two** landing gear safety devices. (2 marks)

(b) With the aid of a labelled diagram, explain the operation of a typical piston type shimmy damper. (6 marks)

(c) Highlight the procedure of servicing a landing gear shock strut. (12 marks)

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