THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING
(AIRFRAME AND ENGINES OPTION)

MODULE II

AIRFRAME SYSTEMS I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
   Answer booklet;
   Drawing instruments.

This paper consists of EIGHT questions.
Answer FIVE of the EIGHT 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.

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1. With the aid of a cross-sectional sketch, discuss the automatic cut off valve (ACOV) under each of the following headings:

(a) reasons for fitting; 
(b) construction; 
(c) operation. (20 marks)

2. (a) Highlight the typical maintenance for controlling aircraft hydraulic fluid contamination. (8 marks)

(b) With respect to the aircraft hydraulic system:

(i) outline five causes of contamination; (5 marks)
(ii) explain the importance of fluid sampling; (2 marks)
(iii) outline five ways of minimizing contamination risks. (5 marks)

3. (a) With the aid of a labelled sketch, describe the operation of an aircraft landing gear control valve. (16 marks)

(b) Outline four general pneumatic duct fitting and handling precautions. (4 marks)

4. (a) Highlight the bleeding procedure for a typical shock strut. (10 marks)

(b) With the aid of a labelled sketch, show the exploded view of the expander tube brake. (10 marks)

5. (a) Highlight five precautions to be observed during assembly of tyres and tubes. (5 marks)

(b) Explain the function of each of the following aircraft pressurization components:

(i) discharge valve;
(ii) safety valve;
(iii) differential capsule;
(iv) inward relief valve;
(v) ditching control valve. (15 marks)
6. (a) With the aid of a labelled cross-section, describe the operation of the chemical oxygen system. (15 marks)

   (b) Highlight the procedure of purging aircraft oxygen systems. (5 marks)

7. (a) With the aid of a labelled schematic sketch, show the basic layout of a simple d.c generator. (8 marks)

   (b) Explain the functions of each of the components of a generator. (12 marks)

8. With the aid of labelled sketches, discuss the cabin sealing locations with reference to aircraft pressurization. (20 marks)