

2506/206

AIRFRAME SYSTEMS I

June/July 2017

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING
(AIRFRAMES 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 questions in the answer booklet provided.

All questions carry equal marks.

Maximum marks for each 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.

1. (a) Outline the function of **five** components of a typical hydraulic reservoir. (10 marks)
- (b) With the aid of a labelled sketch, explain the construction and operation of a hydraulic system double action hand pump. (10 marks)
2. (a) Outline **three** advantages of a tri-cycle landing gear configuration. (3 marks)
- (b) With regard to the aircraft nose landing gear system:
 - (i) show the construction;
 - (ii) highlight the procedure of bleeding the oleo strut 'insitu'. (17 marks)
3. (a) Outline the checks to be carried out during the assembly of a typical aircraft wheel. (5 marks)
- (b)
 - (i) Explain the relationship between the three brake hydraulic systems with the main hydraulic system. (6 marks)
 - (ii) With the aid of a labelled sketch, show an exploded view of a dual piston brake assembly. (9 marks)
4. With reference to aircraft tires:
 - (a) Outline **four** precautions to be observed during each of the following:
 - (i) removal;
 - (ii) storage. (8 marks)
 - (b) With the aid of sketches, describe each of the following damages:
 - (i) flat spot;
 - (ii) chevron cuts. (6 marks)
 - (c) Illustrate and name the type of treads designed for the following surfaces:
 - (i) unpaved;
 - (ii) paved;
 - (iii) wet. (6 marks)
5. (a)
 - (i) With the aid of a labelled sketch, illustrate how a reciprocating engine aircraft supercharger can be used as a source of pressurization. (5 marks)
 - (ii) Other than in (a) (i), state **two** other sources of pressurization. (2 marks)
- (b) Highlight the procedure of charging the oxygen systems of an aircraft. (13 marks)

6. With the aid of a labelled schematic diagram, explain the operation of an aircraft air cycle conditioning system. (20 marks)
7. With reference to aircraft batteries, explain **four**:
- (a) functions; (4 marks)
 - (b) checks to be carried out; (4 marks)
 - (c) factors that determine the capacity; (8 marks)
 - (d) causes for the distortion or explosion of case. (4 marks)
8. With the aid of a labelled diagram, explain the construction and operation of a hydraulic system nose wheel steering system. (20 marks)

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