

2506/206
AIRFRAME SYSTEMS I
June/July 2022
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;

Mathematical tables/Non programmable calculator.

This paper consists of EIGHT questions.

Answer FIVE questions 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 2 printed pages.

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

1. (a) Explain **five** requirements that should be considered when installing hydraulic flexible lines. (5 marks)
- (b) With the aid of a labelled schematic diagram, describe the operation of an aircraft hydraulic flap overload valve. (15 marks)
2. (a) With reference to aircraft air conditioning system, explain **six** requirements. (12 marks)
- (b) With the aid of a labelled schematic diagram, show the construction of an aircraft vapour cycle system. (8 marks)
3. With the aid of a labelled sketch, discuss the construction and principle of operation of an aircraft typical power brake system. (20 marks)
4. (a) With the aid of a labelled cross-sectional sketch, explain the principle of operation of an aircraft shimmy damper. (10 marks)
- (b) Show and label the layout of an aircraft nose gear hydro-mechanical steering system. (10 marks)
5. (a) With reference to aircraft tyre markings, explain each of the following:
 - (i) size markings;
 - (ii) ply rating;
 - (iii) speed rating;
 - (iv) green/grey dots;
 - (v) red dot/triangle.(10 marks)
- (b) With reference to wheel bearing, differentiate between each of the following types of damages:
 - (i) galling and spalling; (4 marks)
 - (ii) brinelling and water stain; (4 marks)
 - (iii) discolouration and rust. (2 marks)
6. With the aid of a labelled schematic diagram, describe the operation of an aircraft battery starting system. (20 marks)
7. (a) Highlight **five** advantages of pneumatic systems. (5 marks)
- (b) Describe the construction and operation of a typical aircraft closed-center, high pressure pneumatic system. (15 marks)
8. (a) Outline the procedure for charging an aircraft oxygen system from a typical oxygen refill cart. (12 marks)
- (b) Discuss the features of an aircraft demand flow oxygen system. (8 marks)

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