

2107/305

AIRFRAME TECHNOLOGY

Oct./Nov. 2018

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AERONAUTICAL ENGINEERING  
(AIRFRAMES AND ENGINES OPTION)

AIRFRAME TECHNOLOGY

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 part of a question are as shown.*

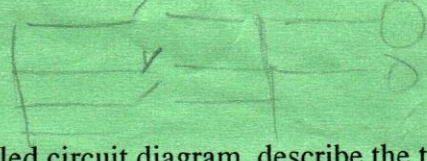
*Candidates should answer the questions in English.*

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.



Seminar



1.\* With the aid of a labelled circuit diagram, describe the thermal switch fire detection system. \* (20 marks)

2. With reference to aircraft fluid ice protection systems: (a) outline the components of a typical control panel; (8 marks)

(b) highlight six maintenance practices; (6 marks)

(c) Describe each of the following: (6 marks)

- (i) proportioning units;
(ii) filter.

Warning System
Dericing Procedure
Testing
Inspection of the inflatable tubes/boots
Inspection of the electrical heating pads
Inspection of the pneumatic pressure ducts
- Visual
- Audio
- dericing control
- antiicing control
- Test Th

3. (a) Explain each of the following requirements for the powered flight control system: (15 marks)

- (i) sensitivity;
(ii) stability;
(iii) irreversibility;
(iv) feel;
(v) back-up.

heavy landings
Excessive turbulence during flight

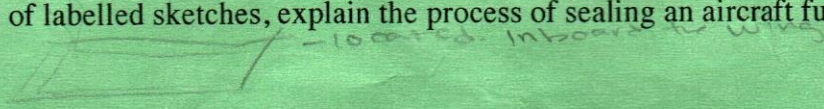
(b) With respect to flight control systems, highlight: (1 mark)

- (i) two operational instances that must necessitate rigging checks;
(ii) eight general rigging procedure for both manually operated and powered flying control systems.

- cable tension
- range of movement
- angle of incident

4. (a) Explain the functions of each of the six fuel sub-systems. (9 marks)

(b) With the aid of labelled sketches, explain the process of sealing an aircraft fuel integral tank. (8 marks)



(c) Outline six advantages of the aircraft pressure refuelling method. (3 marks)

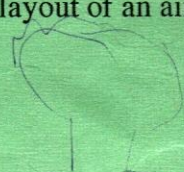
- vapor lock
- primer lock
- clean filter of fuel tank

\* 5. (a) Explain each of the three airframe structure classifications. (3 marks)

(b) Highlight the general aircraft structural repair procedure. (17 marks)

- Truss construction - semimonocoque
- monocoque
- Defect detection
- Defect

6. With the aid of a labelled schematic diagram, show a typical layout of an aircraft cabin temperature control system. (20 marks)



7. Discuss the typical construction features for an aircraft tire. (20 marks)

8. With the aid of a labelled sketch, explain the construction and operation of the hydraulic system automatic cut-out valve. (20 marks)

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column Truss 2

Truss Truss

Stair Switch