

2507/307

**AUTOMATIC PILOT SYSTEM AND  
AIRFIELD SAFETY AND PROCEDURES III**

**June/July 2018**

**Time: 3 hours**



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**DIPLOMA IN AERONAUTICAL ENGINEERING  
(AVIONICS OPTION)**

**MODULE III**

**AUTOMATIC PILOT SYSTEM AND AIRFIELD SAFETY  
AND PROCEDURES III**

**3 hours**

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments.*

*This paper consists of EIGHT questions in TWO sections; A and B.*

*Answer THREE questions from section A and TWO questions from section B 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 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.**



## SECTION A: AUTOMATIC PILOT SYSTEM

Answer **THREE** questions from this section.

1. With the aid of a labelled block diagram:
  - (a) show the signal flow in an autopilot system; (10 marks)
  - (b) explain each of the following basic operation of the autopilot:
    - (i) synchronization;
    - (ii) stabilization. (10 marks)
2. With the aid of labelled block diagram, explain the characteristics of the following types of stabilization:
  - (a) automatic; (10 marks)
  - (b) fly through handling. (10 marks)
3. With the aid of a labelled sketch, describe the constructional features of the autopilot thrust management computer subsystem. (20 marks)
4.
  - (a) Outline **five** characteristics of an autopilot system with respect to auto-stabilization. (5 marks)
  - (b) Describe **nine** elements of an automatic landing subsystem of the autopilot. (9 marks)
  - (c) Outline **six** tests to be carried out on autopilot. (6 marks)
5.
  - (a) Explain the function of each of the following components:
    - (i) director computer;
    - (ii) vertical gyros;
    - (iii) mode controllers;
    - (iv) electronic attitude director indicator. (4 marks)
  - (b) With the aid of a labelled circuit diagram, show how sideslip error can be corrected. (16 marks)



## SECTION B: AIRFIELD SAFETY AND PROCEDURES III

*Answer TWO questions from this section.*

6. (a) Explain **seven** actions pertaining to safety that may warrant revocation or suspension of a maintenance licence by competent authority according to ICAO. (14 marks)
- (b) Explain the importance of quality management. (6 marks)
7. (a) Explain the primary purpose of aircraft accident investigation. (2 marks)
- (b) Explain each of the following terms as applied to flight safety:
- (i) forced landing;
  - (ii) incident;
  - (iii) serious injury. (11 marks)
- (c) Outline **seven** types of information contained in accident notification. (7 marks)
8. (a) Highlight the stores procedure applicable in aircraft maintenance industry. (16 marks)
- (b) Explain the responsibility of the chief inspector in an organization with respect to the stores procedure. (4 marks)

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