

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)

Yaw damper

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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