



EAST AFRICAN SCHOOL OF AVIATION EXAMINATION

ENGINEERING SECTION

SUBJECT: AIRCRAFT PISTON ENGINES

STREAM: MOD 1 (Avionics & Airframes & Engines)

Duration: 3 Hrs

DATE:: 07/04/17

TIME: 2.00 – 5.00pm

INSTRUCTIONS TO CANDIDATE:

1. *This paper consists of **Two(2)** printed pages.*
2. *You should have the following:
scientific calculator
mathematical tables*
3. *Answer any **FIVE** questions*

1. (a) Briefly explain the historical development of aero piston engine. **(15 marks)**
 (b) Discuss why reciprocating engines for aircraft are called heat engines. **(5 marks)**
2. (a) With an aid of diagrams explain the principle of operation of a four stroke cycle engine. **(10 marks)**
 (b) Briefly discuss the operation cycle of the Otto cycle engine. **(10 marks)**
3. (a) Briefly explain the function of the following in an aeropiston engine.
 (i) Dynamic dumpers
 (ii) Piston Retainers
 (iii) Valve seat
 (iv) Camshaft
 (v) Crankcase **(10marks)**
 (b) Discuss why horizontally opposed type of engine design is mostly preferred for use in aircrafts. **(10marks)**
4. (a) (i) Define the term "lubricant" **(2 marks)**
 (ii) Discuss why lubrication is important in an aero piston engine. **(10marks)**
 (b) List **EIGHT** characteristics that should be possessed by a good lubricant in an Aero-piston Engine. **(8marks)**
5. (a) (i) Discuss why cooling is necessary in an aero piston Engine. **(6marks)**
 (ii) Explain how cooling is achieved in an aero piston Engine. **(10marks)**
 (b) Explain **TWO** effects of an overcooled engine. **(4marks)**
6. (a) With the aid of a diagram, briefly explain the principle of operation of a magneto. **(8marks)**
 (b) Explain **TWO** reasons why Dual Ignition system is important in aero piston **(4 marks)**
 (c) Briefly explain how magneto drop is used to monitor the serviceability state of the magnetos in an aircraft **(8 marks)**
7. (a) With the use of a well labeled diagram, explain how a supercharger works in aero-piston **(9 marks)**
 (b) Differentiate between superchargers and turbochargers as applied to aeropiston engines. **(6 marks)**
 (c) Give **FIVE** requirements that aviation fuel should meet. **(5 marks)**
8. (a) Briefly discuss the complication associated with altitude in the following aircraft systems.
 (i) Liquid cooling system
 (ii) magneto Ignition system **(8 marks)**
 (b) Briefly explain how to overcome the complication in (i) above **(12 marks)**