



EAST AFRICAN SCHOOL OF AVIATION EXAMINATION

END TERM EXAMINATION

ENGINEERING SECTION

SUBJECT: AIRFRAME TECHNOLOGY. (A & E)

TREAM: TEP YEAR 2

Duration: 3 Hrs.

DATE 23/3.2016

TIME 9.00 - 12.00PM

INSTRUCTIONS TO CANDIDATE:

1. This paper consists of **THREE (3)** printed pages.
2. All questions carry equal marks.
3. Maximum marks for each part of a question are as shown
4. Attempt all **FIVE** questions.
5. Cheating will lead to exam cancellation.
6. You should have the following:-
 - Mathematical Tables
 - Scientific Calculator.

AIRFRAME TECHNOLOGY. (A & E Y2 TEP)

1. (a) With aid of a labelled sketch explain the operation of an aircraft hydraulic system fitted with an engine driven pump.
(10 marks)
(b) Outline **FOUR** major characteristics that must be considered when selecting aircraft hydraulic fluid for a particular system. **(4 marks)**
(c) Discuss **THREE** common types of hydraulic fluids used in aeroplanes. **(6 marks)**

2. (a) Outline **FOUR** requirements of a basic environmental control system. **(8 marks)**
(b) State **TWO** ways of obtaining high pressure air to pressurize the aircraft cabin. **(4 marks)**
(c) Explain **FOUR** methods of controlling cabin pressure. **(8 marks)**

3. (a) Discuss the testing procedure of **THREE** different types of oxygen cylinders.
(9 marks)
(b) Describe **TWO** types of continuous flow regulators in oxygen systems.
(6marks)
(c) Explain the operation of a diluter demand regulator.
(5 marks)

4. (a) Outline any **FIVE** main requirements of an ideal fuel for gas turbine or piston engine.
(5marks)
(b) With aid of labelled sketches describe two aircraft fuel systems.
(12marks)
(c) Explain the meaning of the following fuel system terminologies: -
(i) Waxing
(ii) Fuel boiling.
(iii) Vapour lock
(3 marks)

5. (a) With the aid of labelled sketches explain the operation of the following flying control systems:-
(i) Powered
(ii) Power-assisted **(16 marks)**
(b) Explain the meaning of the following terms as applied to flying control system:

- (i) Reversible
(ii) Irreversible
(4 marks)
- 6 (a) Outline any **FOUR** advantages of using compressed air over hydraulic or electrical system
(8 marks)
- (b) With aid of labelled sketches explain the operation of the following aircraft pneumatic system components:
- i. Relief valve
 - ii. Check valve
 - iii. Orifice restrictor
 - iv. Variable restrictor
- (12 marks)**
7. (a) Give detailed sequence of operation when the hydraulic landing gear is selected
- (i) Up
 - (ii) Down
- (10 marks)**
- (b) Outline any **FOUR** incidents that would necessitate landing gear retraction checks to be carried out
(4 marks)
- (c) Explain any **SIX** specific inspections to be performed when making a retraction check on an aircraft undercarriage.
(6 marks)
8. (a) Differentiate between the terms “stress” and “strain” as applied to aircraft structures.
(2 marks)
- (b) Describe each of the **FOUR** major stresses to which all the aircraft structures are subjected to. Illustrate your answers. **(8 marks)**
- (c) With the aid of labelled sketches, describe the main structural members of each of following semi monocoque fuselage;
- i. Tailcone
 - ii. Vertical stabilizer
- (10 marks)**