# KENYA AERONAUTICAL COLLEGE

**DIPLOMA IN AERONAUTICAL ENGINEERING**

**YEAR 3, TERM 1**

**GAS TURBINE ENGINES**

**DIP 08MECHANICAL.**

**END TERM**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**DATE: November 13, 2012 TIME: 2 ½ HOURS**

**STARTING TIME: 0800 HRS**

**Instructions:**

* Attempt all the questions

1. (a) Outline TWO functions of each of the following aircraft engine parts
2. Nozzle guide vanes
3. Inlet guide vanes
4. Turbines **(6 marks)**

(b) Explain the operation of each of the following types of aircraft engine turbines

1. Impulse
2. Free
3. Reaction **(6 marks)**

(c) With the aid of labeled sketches show FOUR methods of attaching turbine blades to the turbine discs of an aircraft engine **(8 marks)**

1. (a) Describe the term fault free fire detection system as applied to aircraft engines

**(2 marks)**

(b) Explain the conditions of aircraft fires under each of the following

1. Detection
2. Containment
3. Extinguishing **(6 marks)**

(c) With the aid of a sketch describe a typical engine fire extinguishing system using the fire control handle in the cockpit **(12 marks)**

1. (a) Outline five functions of aircraft engine bleed air **(5 marks)**

(b) With the aid of a sketch explain the ground generator cooling system

**(7 marks)**

(c) Sketch a twin sprol by pass gas turbine engine section and show internal air cooling and sealing system **(8 marks)**

1. Using a pressure volume diagram and a cross- sectional sketch, explain the construction, operation and generation of thrust of a TWO-stage single entry centrifugal flow compressor aircraft turbo-propeller.