



EAST AFRICAN SCHOOL OF AVIATION

FINAL EXAMS

**DIPLOMA IN FLIGHT OPERATIONS/DISPATCH
AIRCRAFT PERFORMANCE**

Duration: 3 hrs

DAY/DATE: 11/11/2016

TIME:8.30 – 10.30 AM

INSTRUCTION TO CANDIDATES

Attempt ALL Questions in Section
-Attempt any THREE questions in Section B

SECTION A:

1. The distance a propeller actually advances in one revolution is:
 - a. Twisting
 - b. Effective pitch
 - c. Geometric pitch
 - d. Blade pitch

2. Which wind-shear condition results in a loss of airspeed
 - a. Decreasing headwind or tailwind
 - b. Increasing headwind and decreasing tailwind
 - c. Decreasing headwind and increasing tailwind
 - d. Increasing headwind or tailwind

3. In a straight level powered flight the following principal forces act on an aircraft:
 - a. Thrust,lift,weight
 - b. Thrust,lift,drag,weight
 - c. Thrust,lift,drag
 - d. Lift,drag,weight

4. After an aircraft has been exposed to severe weather:
 - a. Snow should be removed but smooth ice may be left.
 - b. All snow and ice should be removed.
 - c. Loose snow may be left but ice must be removed.
 - d. Providing the contamination is not too thick, it may be left in place.

5. By changing the angle of attack of a wing, the pilot can control the airplane's :
 - a. Lift and airspeed, but not drag.
 - b. Lift, gross weight and drag.
 - c. Lift, airspeed and drag.
 - d. Lift and drag but not airspeed.p

6. The statement “ energy and mass can neither be created nor destroyed ,only changed from one form to another”, refers to:
 - a. Bernoulli's theorem.
 - b. The equation of kinetic energy.
 - c. The principal of continuity
 - d. Bernoulli's principle of continuity

7. If the cross sectional area of an airflow is mechanically reduced:
- The velocity of the airflow remains constant and the kinetic energy increases
 - The velocity of the airflow remains constant and the mass flow increase
 - The mass flow remains constant and the static pressure increases
 - The Mass flow remains constant and the velocity of the airflow increases
8. Mach number is:
- The aircraft True Air Speed divided by the local speed of sound.
 - The speed of sound in the ambient conditions in which the aircraft is flying.
 - True Airspeed of the aircraft at which the relative airflow somewhere on the aircraft reaches the local speed of sound
 - Is directly proportional to the True Air Speed of the Aircraft.
9. Maximum Take Of Mass (MTOM) is best defined as:
- Maximum permissible total mass at the start of the take off run.
 - Maximum permissible total mass prior to taxiing.
 - Maximum permissible total mass prior to take off.
 - Maximum permissible total mass at the point of rotation.
10. Air density is:
- Mass per unit volume.
 - Proportional to temperature and inversely proportional to pressure.
 - Independent of both temperature and pressure.
 - Dependent only on decreasing pressure with increasing altitude.

SECTION B:

- 1)
- Compute the aircraft LIFT required for an aircraft given the following parameters
 Aircraft mass: 6000 kg
 Velocity 200 m/s
 Wing area: 105 square meters
 Coefficient of Lift: 0.4
 Density of Air: 1.225 kg/m³
 Gravitational acceleration: 10 m/s² (6 Marks)
 - Outline any TWO effects of windshear in aircraft performance (6 Marks)

c. With the aid of sketches, describe FOUR types of Flaps (8 Marks)

2) Discuss LIFT in relation to aircraft performance. Use sketches. (20 Marks)

3)

a. Briefly describe how thrust is generated in propellers operation

4 Marks

b. Illustrate any THREE forces that act on a propeller in flight (6 Marks)

c. Define and illustrate the following terminologies as applicable to an aerofoil:

i. Chord

ii. Wing area

iii. Taper Ratio

iv. Angle of attach

(10 Marks)

4)

a. Differentiate between Longitudinal and Lateral stability. (4 Marks)

b. Illustrate the three main axis in relation to Flight Control, state the Flight Control Device responsible for each. (8 Marks)

c. Explain FOUR factors that affect DRAG. (8 Marks)

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