

LEVEL FOUR – AVIATION SUBJECTS COMBINED ASSESSMENT

STUDY GUIDE

PO 431 – EXPLAIN PRINCIPLES OF FLIGHT

- Auxiliary airfoils that move out in front of the leading edge at high angles of attack are called slats.
- Passages built into the wing that affect the airflow in the same way as slats are called slots.
- Flaps create both lift and drag.
- Wing tip modifications designed to increase lift and reduce drag include wing tip fuel tanks, winglets, and drooping the wing tips.
- Wash-in increases the angle of incidence at the wing tip.
- Camber is the curvature of an airfoil.
- Divide the span by the average chord to calculate the aspect ratio.
- Laminar airfoils are generally the thickest at 50% of the chord, and reduce drag by maintaining the laminar flow of air throughout a greater percentage of the chord.
- A decrease in the density of the air as the altitude of an aircraft increases can cause density errors in the ASI
- The ASI is connected to both the pitot pressure source and the static pressure port.
- Pitot pressure is affected by both turbulence and motion.
- Precession is the tendency of a rotating body, when a force is applied perpendicular to its plane of rotation, to turn in the direction of its rotation 90 degrees to its axis and take up a new plane of rotation parallel to the force applied.
- Gyroscopic inertia is also known as rigidity in space.
- Density altitude is the pressure altitude corrected for temperature.
- When flying into an area with a relatively higher pressure, the altimeter will read lower than the actual altitude if the altimeter setting is not corrected.

P0 432 – DESCRIBE AERO ENGINE SYSTEMS

- Forward movement of the throttle opens the throttle valve, which increases the fuel/air mixture, and increases the power being produced by the engine

- The pilot uses a fuel selector valve which both selects the desired fuel tank from which to draw fuel and shut off the flow of fuel from the tanks.
- In a gravity feed system the fuel tank should be positioned above the carburetor.
- Properties of the engine oil are measured by the oil pressure and oil temperature gauges.
- The distance a propeller travels forward in one revolution is known as pitch.
- Thrust is maintained throughout most of the diameter of the propeller by means of the variation in airfoil sections and the angle of attack.
- Power decreases in the engine as the altitude increases and the air becomes less dense.
- When the engine is not running the manifold pressure gauge will register atmospheric pressure.
- Red, yellow, and green arcs are found on the tachometer.
- Surface friction causes lower wind speeds than would be expected from the pressure gradient.

PO 436 – EXPLAIN ASPECTS OF METEOROLOGY

- The three main factors that determine the weather in an air mass are the moisture content, the stability of the air, and the cooling process.
- In stable air, stratus clouds and poor visibility are common, while in unstable air, cumulus cloud and good visibility are common.
- A gust is a rapid and irregular change of wind speed.
- An anabatic wind is the term for up-slope winds flowing from valleys to high elevations above.
- Down-slope winds flowing from high elevations down the slopes to valleys below are known as katabatic winds.
- An air mass is a large section of the troposphere with uniform properties of temperature and moisture in the horizontal.

PO 437 – EXPLAIN ASPECTS OF AIR NAVIGATION

- Parallels of latitude are circles on the Earth's surface that lie parallel to the equator. They are measured from 0-90 degrees north and south of the equator, in degrees, minutes, and seconds.
- Meridians of longitude are semi-great circles that join the geographic poles of the Earth.
- The advantage of a great circle route is that it is the shortest distance between two points on the surface of the Earth.

- If you are flying east your heading is 90 degrees. If you are flying north east your heading is 45 degrees.
- On turns from south, northerly turning error causes the compass to lead.
- The angle between true heading and magnetic heading is variation.
- Lines drawn on a chart joining places having the same variation are isogonic lines.