Private Pilot's Licence

Aeroplanes (Landplanes) Groups A, B and C

Syllabuses of Ground Examination

1 AVIATION LAW, FLIGHT RULES AND PROCEDURES

1.1 Aeronautical Information Publication, NOTAMs and Aeronautical Information Circulars. A detailed knowledge of the operational provisions of:

1.1.1 Aerodromes

Limitations of use; customs facilities; identification beacons.

1.1.2 Air Traffic Rules and Services

Definitions; Visual Flight Rules, Instrument Flight Rules. Types of airspace and air traffic service units. The flight plan. 'Airmiss' reporting procedures. Altimeter setting procedures. Flight in various types of airspace, e.g. at aerodromes, within flight information regions, control zones and airways, on advisory routes and in advisory service areas. Airspace restrictions and hazards. Ground signals and lights. Marshalling signals.

1.1.3 Meteorology

Methods of obtaining flight forecasts (but not names of stations).

1.1.4 Facilitation

Arrival, departure and transit of civil aircraft on international flights. Private flights; documentary requirements and advance notice or permit requirements. Arrival, departure and transit of passengers and crew. Customs, public health and security requirements.

1.1.5 Search and Rescue

Organisation and Responsibility. Aircraft not equipped with radio. Visual distress and urgency signals.

1.1.6 Any information which may from time to time be added to the AIP, NOTAMs and AICs, and of which a private pilot should have a working knowledge.

1.2 **The Malaysian Civil Air Regulation 1996**

A general knowledge of the provisions, with particular reference to the following:

Aircraft to be Registered
Application for Registration

Certificate of Airworthiness
Certificate of Maintenance Review
Technical log
Inspection, overhaul, repair, replacement and modification
Equipment to be carried
Radio Equipment
Engine and Propeller log books
Weight Schedule
Composition of Crew
Crew Licences
Personal Flying Log Books
Flying Instruction
Pilot to remain at Controls
Dudes of a Commander
Passenger briefing by Commander
Operation of Aircraft Radio

Flight Data Recorders
Towing of Gliders
Picking up of articles or persons
Dropping of Articles
Dropping of Persons
Carriage of Munitions
Carriage of Dangerous Goods
Carriage of Persons
Imperilling Safety of Aircraft
Imperilling Safety of Persons and Property
Drunkenness

Smoking
Authority of Commander
Exhibitions of Flying
Documents to be Carried
Production of Documents

Offences in Relation to Documents and Records

Rules of the Air

Power to Prohibit or Restrict Flying

Balloons, Kites and Airships
Licensed Aerodromes
Aviation Fuel
Penalties
Interpretation
Classification of Aircraft
A and B Conditions
Categories of Aircraft

Aircraft Equipment
Radio and Radio Navigation Equipment
Privileges of Private Pilot's Licence (Aeroplanes)
Privileges of Private Pilot's Licence
(Helicopters/Gyroplanes)
Privileges of Ratings
Certificate of Test or Experience

1.3 **The Rules of the Air**

Interpretation
General
Lights and Signals to be shown by aircraft
General Flight Rules
Visual Flight Rules
Instrument Flight Rule
Aerodrome Traffic Rules
Special Rules
Aerodrome Signals and Markings: Visual and Aural Signals

1.4 **The Civi1 Aviation (Investigation of Air Accidents)**
Notification of Accidents – Regulation 124

1.5 **The Air Navigation (Investigation of Air Accidents Involving Civil and Military Aircraft or Installations)**
Duty to furnish information relating to accidents
NOTE: 1 Publications may not be consulted during the examination.
2 Candidates will not be required to memorise details of geographical positions or of special procedures applicable to a particular aerodrome, flight information region, control zone or Airway.

2 NAVIGATION

2.1 **Aeronautical Charts**

Practical use of the 1:500,000 (Lambert Conformal Conic), and the 1:250,000 topographical charts, including a knowledge of: representative fraction, methods of indicating relief, the principal ICAO chart symbols, isogonals, latitude and longitude, plotting positions, measuring tracks and distances.

2.2 Units of distance and height used in navigation, viz. nautical miles, statute miles, kilometres, metres and feet. Conversion from one unit to another.

2.3 Track, heading (true, magnetic and compass). Variation and deviation. Airspeed (IAS, RAS, TAS), Ground Speed, Wind Velocity, and Drift.

2.4 The use of the navigational computer for the determination of heading, airspeed, groundspeed, wind velocity, track and drift angle. The use of the slide rule for solving simple fuel calculations. Methods of determining track error and

corrections to heading by the 1 in 60 rule, and by 5 degree and 10 degree lines. Corrections to ETA Flight Planning.

2.5 The direct reading magnetic compass; unreliability during turns and accelerations; the effect of metal objects placed in the vicinity of the compass.

3 METEOROLOGY

3.1 Properties of the Atmosphere

Relationship between temperature, pressure and density. International Standard Atmosphere.

3.2 Wind

Relationship between wind and isobars; Gusts, squalls and turbulence; Diurnal variation of wind; Variation of wind with height; Sea breezes, Airflow in vicinity of high ground, and Low level wind shear.

3.3 Clouds and Precipitation

Clouds associated with different types of precipitation; Flight conditions in and near clouds giving precipitation; Cumulonimbus and thunderstorms, and Orographic effects.

3.4 Visibility

Fog, mist, haze and their differences; Formation and clearance of radiation and advection fog (diurnal variations); Hill fog, and Vertical and oblique visibility.

3.5 Fronts and Pressure Systems

Characteristics of warm and cold front and occlusions; and Weather associated with depressions, anticyclones, cols and different air masses.

3.6 Icing

Airframe icing in relation to cloud types; Hoar frost; Rain ice, and Engine icing.

3.7 Altimetry

Correction for variations in surface pressure; Variation of pressure with height, and QFE and QNH.

3.8 Forecasts, Reports and Warnings

Contents of and terms and symbols used in aviation forecast documents (including TAFs), in other forms of forecast service (including pre-recorded voice), and

weather reports (including METARs), available to the private pilot, and SIGMETs and Aerodrome Warnings.

4. HUMAN PERFORMANCE AND LIMITATlONS

4.1 Basic Aviation Physiology and Health Maintenance

4.1.1 Basic Physiology and the Effects of Flight

4.1.1.1 Anatomy and physiology of the eye, ear, vestibular, circulatory, and respiratory systems.

Composition of the atmosphere, gas laws, and the nature of the human requirement for oxygen.

Effects of reduced ambient pressure and of sudden decompression; times of useful consciousness.

Recognising and coping with hypoxia and hyperventilation.

Entrapped gases and barotraurna.

Diving and flying.

Effects of acceleration (± G) on circulatory system, vision, and consciousness.

Mechanism, effects, and management of motion sickness.

4.1.2 Flying and Health

4.1.2.1 Noise- and age-induced hearing loss.

Visual defects and their correction.
ECG, blood pressure, arterial disease and coronary risk factors.
Alcoholism.
Common ailments and fitness to fly; gastro-enteritis, colds, use of common drugs and their side effects.
Toxic hazards.
Causes of in-flight incapacitation.

4.2 Basic Aviation Psychology

4.2.1 Basic plan of human information processing, including the concepts of sensation, attention, memory, central decision-making, and the creation of mental models.
Limitations of central decision channel and mental workload.
Function of attention in selecting information sources, attention-getting stimuli.
General structure and limitations of memory.
Perception, the integration of sensory information to form a mental model.
Effects of experience and expectation on perception.

Erroneous mental models; visual, vestibular, and other illusions.
Recognising and managing spatial disorientation.
Use of visual cues in landing.
Eye movements, visual search techniques, mid-air collisions.
Skill-, rule-, and knowledge-based behaviour.
The nature of skill acquisition, the exercise of skill, conscious and automatic behaviour, errors of skill.
Rule-based behaviour, procedures, simulator training, failure of rule-based behaviour.
Knowledge-based behaviour, problem solving and decision making, inference. formation, failures in knowledge-based behaviour.
Maintaining accurate mental models, situational awareness, confirmation bias.

4.3 Stress and Stress Management

4.3.1 Definitions, concepts, and models of stress.
Arousal; concepts of over- and under-arousal.
Environmental stresses.
Domestic stress.
Fatigue.
Effects of stress on attention, motivation, and performance.
Life stress.
Coping strategies, identifying stress and stress management.

4.4 Social Psychology and Ergonomics of the Flight Deck

4.4.1 Individual Differences, Social Psychology

4.4.1.1 Individual differences, definitions of intelligence and personality.

Assessing personality.

Main dimensions of personality: extroversion and anxiety. Other important traits: warmth and sociability, impulsivity, tough-mindedness, dominance, stability, and boldness.

Individual personality related problems of flying, especially risk-taking.

Concepts of conformity, compliance, and risk shift. Interacting air traffic services, maintenance personnel, and passengers.

Judgement, making decisions and assessing risk.

4.4.2 The Design of Flight Decks, Documentation and Procedures

4.4.2.1 Basic principles of control, display, and workspace design.

Eye datum, anthropometry, and workspace constraints. External vision requirements, reach, comfort and posture.

Display size, legibility, scale design, colour, and illumination. Common errors in display interpretation.

Control size, loading, location and compatibility of controls with displays.

The presentation of warning information and misinterpretation of warnings.

The design and appropriate use of checklists and manuals.

5 AIRCRAFT (GENERAL)

5.1 Properties of Air

Density, pressure, temperature, humidity and relationship between these properties. International Standard Atmosphere.

5.2 Principles of Flight

Meaning and significance of terms. Relationship of thrust/drag, lift/weight, aerofoil/angle of attack/centre of lift/stall. Forces on sailplane. Balance of forces in flight. Stability and instability. Drag (induced/parasite). Stalling: Effect of weight, angle of bank. Spinning. Range and Endurance.

5.3 Flying Controls

Aileron, rudder, elevator, stabilator - direction of movement and effect. Principles of mass and aerodynamic balance. Knowledge of trimming devices - direction of movement and effect. Knowledge of flaps, slats and spoilers - use and effect.

5.4 Engines

A general knowledge of the principles and operation of a piston engine and associated systems (eg ignition, cooling, carburation, fuel, oil and carburettor heat). Principles of fixed pitch propeller. Control of engines and indications of performance and limitations. Mixture control. A general understanding of the possible technical reasons for engine failure in flight.

5.5 Systems

5.5.1 D.C. Electrics

A general knowledge of the principles of generating and distribution systems. Voltage and current control. Batteries, capacity.

5.5.2 Instruments General

A general knowledge of the pilot/static system and the operation of associated instruments. A general knowledge of the operation of gyroscopic flight instruments and also instruments associated with electrical, engine and vacuum systems.

5.5.3 Vacuum

Knowledge of systems in use. Norma/abnormal indications.

5.5.4 Landing Gear, fixed

Shock absorbers, brakes, tyres. Particular emphasis on recognition of wear and defects. Nose/tail wheel steering.

5.5.5 Heating and Ventilating

Knowledge of systems generally in use.

5.6 **Loading and Performance**

Understanding of principles of weight and balance, significance of C of G datum and importance of establishing C of G position within the correct range. Knowledge of precautions when loading aircraft, eg security of loads and hazards of magnetic and flammable goods. Factors affecting take-off, climb and landing performance.

5.7 **Emergencies**

General principles of action to be taken in the event of fire in the air or on the ground. Types of fire extinguishers and method of use.

5.8 **Aeromedical**

5.8.1 Basic knowledge of First Aid and use of generally available kits. Knowledge of requirements for, stowage and use of life jackets and liferafts.

5.8.2 Physiological Factors: The senses, spatial disorientation and sensory illusions.

5.8.3 Effects of colds, alcohol and drugs.

5.8.4 Recognition of the effects of hypoxia carbon monoxide and knowledge of their dangers.

5.9 **Aircraft Airworthiness**

5.9.1 Knowledge of requirements for and content of:

Certificate of Airworthiness,
Certificate of Release to Service,
Certificate of Maintenance Review.

5.9.2 Understanding of requirements of an Approved Maintenance Schedule (usually General Purpose Maintenance Schedule).

5.9.3 Understanding of scope and responsibility for Pilot Maintenance and Duplicate Control Inspections.

5.10 **Structural Limitations**

Precautions to be observed when recovering from the more unusual attitudes of flight, e.g. steep turns, steep dives, etc. Avoiding excessive 'g' forces. Understanding of action following a heavy landing or after flight through severe turbulence and the typical indications.

6. AIRCRAFT (TYPE) - GROUPS A AND B

6.1 This examination will be an oral exam conducted by a PPL(X) Examiner at the time of the GFT and will be confined to the type of aeroplane upon which the candidate is being flight tested.

6.2 All candidates whether for Groups A and B aeroplanes will be expected to demonstrate to the Examiner that they have achieved a satisfactory standard of knowledge in the following areas:

(a) Pilot Maintenance

(b) Airframe Limitations
Including weight and balance calculations from the Flight Manual (or equivalent document).

(c) Aircraft Systems
Flying Controls and Flaps.
Landing Gear (fixed or retractable as applicable).
Electrical System.
Heating and Ventilating Systems.
Flight Instruments.
Power Plant, Fuel and Oil Systems.
Propellers (fixed pitch or variable pitch as applicable).

6.3 In addition to the above a candidate will (where applicable) be required to demonstrate a satisfactory knowledge in the following areas for more complex aircraft, particularly those in Group B:

Hydraulic System.
Cabin Heating System.
Airframe/Propeller De-icing and Anti-icing.
Oxygen and Pressurisation Systems.
Auto Pilot.
Propeller (Feathering).
Asymmetric airframe and engine limitations (Use of the 'V' speeds).

Flight Director System.

7 EXAMINER'S ASSESSMENT SHEET FOR GROUND EXAMINATION AIRCRAFT (TYPE)

PASS/FAIL

PILOT MAINTENANCE

AIRFRAME LIMITATIONS (including weight and balance calculations using the flight manual or equivalent document)

WEIGHT AND PERFORMANCE (practical calculations using flight manual or equivalent document)

RANGE AND ENDURANCE (practical calculations using flight manual or equivalent document)

FLYING CONTROLS AND FLAPS
LANDING GEAR
(Fixed or Retractable as applicable)
ELECTRICAL SYSTEM
HEATING AND VENTILATION SYSTEM
FLIGHT INSTRUMENT/VACUUM
Pitot Static Systems
ENGINE(S) AND CONTROL
FUEL SYSTEM
OIL SYSTEM
PROPELLER
(fixed pitch, VP, or feathering as applicable)
HYDRAULIC SYSTEM
CABIN HEATING SYSTEM
AIRFRAME/PROPELLER
De-icing and Anti-icing
OXYGEN SYSTEM
PRESSURISATION SYSTEM
AUTO-PILOT
ASYMMETRIC OPERATING
Speeds & Limitations
FLIGHT DIRECTOR SYSTEM

8 GROUND EXAMINATION - AIRCRAFT (TYPE) — GROUP C

A pilot wishing to include a Group C Aeroplane in his licence will be required to take the Professional Pilot's Examination Aircraft (Type).