AMC/IEM C – PRIVATE PILOT LICENCE

AMC FCL 1.125

Syllabus

of

1. theoretical knowledge

and

2. flight instruction

for the

private pilot licence

(aeroplane)

PPL(A)

See JAR–FCL 1.125
(See Appendix 1 to JAR–FCL 1.125)

1. SYLLABUS

OF

THEORETICAL KNOWLEDGE

FOR

THE

PRIVATE PILOT LICENCE

(AEROPLANE)

PPL(A)

AIR LAW

Legislation

1 The Convention on International Civil Aviation

2 The International Civil Aviation Organisation

3 Articles of the Convention

- 1 Sovereignty
- 2 Territory
- 5 Flight over territory of Contracting States
- 10 Landing at customs airports
- 11 Applicability of air regulations
- 12 Rules of the air
- 13 Entry and clearance regulations of Contracting States
- 16 Search of aircraft
- 22 Facilitation of formalities
- 23 Customs and immigration procedures
- 24 Customs duty
- 29 Documents to be carried in aircraft
- 30 Use of aircraft radio equipment
- 31 Certificate of airworthiness
- 32 Licences of personnel
- 33 Recognition of certificates and licences
- 34 Journey log books
- 35 Cargo restrictions
- 36 Restrictions on use of photographic equipment
- 37 Adoption of international standards and procedures
- 39 Endorsement of certificates and licences
- 40 Validity of endorsed certificates and licences

4 Annexes to the Convention ('ICAO Annexes')

Annex 7 Aircraft nationality and registration marks
- definitions
- aircraft registration marks
- certificate of registration
- identification plate

Annex 8 Airworthiness of aircraft
- definitions
- certificate of airworthiness
- continuing airworthiness
- validity of certificate of airworthiness
- instruments and equipment
- aircraft limitations and information

Rules of the air

Annex 2 Rules of the air
- definitions
- applicability
- general rules
- visual flight rules
- signals (Appendix 1)
- interception of civil aircraft (Appendix 2)

Air traffic regulations and air traffic services

Annex 11 Air traffic regulations and air traffic services
- definitions
- objectives of air traffic services
- classification of airspace
- flight information regions, control areas and control zones
- air traffic control services
- flight information services
- alerting service
- visual meteorological conditions
- instrument meteorological conditions
- in-flight contingencies

Annex 14 Aerodrome data
- definitions
- conditions of the movement area and related facilities

- Visual aids for navigation
  - indicators and signalling devices
  - markings
  - lights
  - signs
  - markers
  - signal area
- Visual aids for denoting obstacles
  - marking of objects
  - lighting of objects
- Visual aids for denoting restricted use of areas
- Emergency and other services
  - fire and rescue service
  - apron management service
- Aerodrome ground lights and surface marking colours
  - colours for aeronautical ground lights
  - colours for surface markings

5 ICAO Document 4444 – Rules of the air and air traffic services

General provisions
- definitions
- ATS operating practices
- flight plan clearance and information
- control of air traffic flow
- altimeter setting procedures
- wake turbulence information
- meteorological information
- air reports (AIREP)

Area control service
- separation of controlled traffic in the various classes of airspace
- pilots, responsibility to maintain separation in VMC
- emergency and communications failure procedures by the pilot
- interception of civil aircraft

Approach control service
- departing and arriving aircraft procedures in VMC

Aerodrome control service
- function of aerodrome control towers

- VFR operations
- traffic and circuit procedures
- information to aircraft
- control of aerodrome traffic

Flight information and alerting service
- air traffic advisory service
- objectives and basic principles

JAA regulations

6 Joint Aviation Authorities (JAA) Regulations (JAR)

JAR–FCL Subpart A – General requirements
- 1.025 – Validity of licences and ratings
- 1.035 – Medical fitness
- 1.040 – Decrease in medical fitness
- 1.050 – Crediting of flight time
- 1.065 – State of Licence issue

JAR–FCL Subpart B – Student pilot
- 1.085 – Requirements
- 1.090 – Minimum Age
- 1.095 – Medical fitness

JAR–FCL Subpart C – Private pilot licence
- 1.100 – Minimum Age
- 1.105 – Medical fitness
- 1.110 – Privileges and conditions
- 1.115 – Ratings for special purposes
- 1.120 – Experience and Crediting
- 1.125 – Training course
- 1.130 – Theoretical knowledge examination
- 1.135 – Skill test

JAR–FCL Subpart E – Instrument rating
- 1.175 – Circumstances in which an instrument rating is required

JAR–FCL Subpart F – Type and Class Ratings
- 1.215 – Division of Class Ratings
- 1.225 – Circumstances in which type or class ratings are required
- 1.245 – Validity, revalidation and renewal

JAR–FCL Subpart H – Instructor ratings
- 1.300 – Instruction – general

AIRCRAFT GENERAL KNOWLEDGE

Airframe

7 Airframe structure
- components
- fuselage, wings, tailplane, fin
- primary flying controls
- trim and flap/slat systems
- landing gear
  - nose wheel, including steering
  - tyres, condition
  - braking systems and precautions in use
  - retraction systems

8 Airframe loads
- static strength
  - safety factor
  - control locks and use
  - ground/flight precautions

Powerplant

9 Engines – general
- principles of the four stroke internal combustion engine
- basic construction
- causes of pre-ignition and detonation
- power output as a function of RPM

10 Engine cooling
- air cooling
- cowling design and cylinder baffles
- design and use of cowl flaps
- cylinder head temperature gauge

11 Engine lubrication
- function and methods of lubrication
- lubrication systems
- methods of oil circulation
- oil pump and filter requirements
- qualities and grades of oil
- oil temperature and pressure control
- oil cooling methods
- recognition of oil system malfunctions

12 Ignition systems
- principles of magneto ignition
- construction and function
- purpose and principle of impulse coupling
- serviceability checks, recognition of malfunctions
- operational procedures to avoid spark plug fouling

13 Carburation
- principles of float type carburettor
- construction and function
- methods to maintain correct mixture ratio
- operation of metering jets and accelerator pump

- effect of altitude
- manual mixture control
  - maintenance of correct mixture ratio
  - limitation on use at high power
  - avoidance of detonation
- idle cut-off valve
- operation and use of primary controls
- air induction system
- alternate induction systems
- carburettor icing, use of hot air
- injection systems, principles and operation

14 Aero engine fuel
- classification of fuels
  - grades and identification by colour
  - quality requirements
- inspection for contamination
- use of fuel strainers and drains

15 Fuel systems
- fuel tanks and supply lines
- venting system
- mechanical and electrical pumps
- gravity feed
- tank selection
- system management

16 Propellers
- propeller nomenclature
- conversion of engine power to thrust
- design and construction of fixed pitch propeller
- forces acting on propeller blade
- variation of RPM with change of airspeed
- thrust efficiency with change of speed
- design and construction of variable pitch propeller
- constant speed unit operation
- effect of blade pitch changes
- windmilling effect

17 Engine handling
- starting procedures and precautions
- recognition of malfunctions
- warming up, power and system checks
- oil temperature and pressure limitations
- cylinder head temperature limitations
- ignition and other system checks
- power limitations
- avoidance of rapid power changes
- use of mixture control

Systems

18 Electrical system
- installation and operation of alternators/generators
- direct current supply
- batteries, capacity and charging
- voltmeters and ammeters

– circuit breakers and fuses
– electrically operated services and instruments
– recognition of malfunctions
– procedure in the event of malfunctions

19 Vacuum system
– components
– pumps
– regulator and gauge
– filter system
– recognition of malfunction
– procedures in the event of malfunctions

Instruments

20 Pitot/static system
– pitot tube, function
– pitot tube, principles and construction
– static source
– alternate static source
– position error
– system drains
– heating element
– errors caused by blockage or leakage

21 Airspeed indicator
– principles of operation and construction
– relationship between pitot and static pressure
– definitions of indicated, calibrated and true airspeed
– instrument errors
– airspeed indications, colour coding
– pilot's serviceability checks

22 Altimeter
– principles of operation and construction
– function of the sub-scale
– effects of atmospheric density
– pressure altitude
– true altitude
– international standard atmosphere
– flight level
– presentation (three needle)
– instrument errors
– pilot's service ability checks

23 Vertical speed indicator
– principles of operation and construction
– function
– inherent lag
– instantaneous VSI
– presentation
– pilot's serviceability checks

24 Gyroscopes
– principles
– rigidity
– precession

25 Turn indicator
- rate gyro
- purpose and function
- effect of speed
- presentation
- turn co-ordinator
- limited rate of turn indications
- power source
- balance indicator
  - principle
  - presentation
- pilot's serviceability checks

26 Attitude indicator
- earth gyro
- purpose and function
- presentations
- interpretation
- operating limitations
- power source
- pilot's serviceability checks

27 Heading indicator
- directional gyro
- purpose and function
- presentation
- use with magnetic compass
- setting mechanism
- apparent drift
- operating limitations
- power source
- pilot's serviceability checks

28 Magnetic compass
- construction and function
- earth's magnetic field
- variation and deviation
- turning, acceleration errors
- precautions when carrying magnetic items
- pilot's service ability checks

29 Engine instruments
- principles, presentation and operational use of:
  - oil temperature gauge
  - oil pressure gauge
  - cylinder head temperature gauge
  - exhaust gas meter
  - manifold pressure gauge
  - fuel pressure gauge
  - fuel flow gauge
  - fuel quantity gauge(s)
  - tachometer

30 Other instruments
- principles, presentation and operational use of:
  - vacuum gauge
  - voltmeter and ammeter

- warning indicators
- others relevant to aeroplane type

Airworthiness

31 Airworthiness
- certificate to be in force
- compliance with requirements
  - periodic maintenance inspections
  - compliance with flight manual (or equivalent), instructions, limitations, placards
- flight manual supplements
- provision and maintenance of documents
  - aeroplane, engine and propeller log books
  - recording of defects
- permitted maintenance by pilots

FLIGHT PERFORMANCE AND PLANNING

Mass and balance

32 Mass and balance
- limitations on maximum mass
- forward and aft limitations of centre of gravity, normal and utility operation
- mass and centre of gravity calculations – aeroplane manual and balance sheet

Performance

33 Take-off
- take-off run and distance available
- take-off and initial climb
- effects of mass, wind and density altitude
- effects of ground surface and gradient
- use of flaps

34 Landing
- effects of mass, wind, density altitude and approach speed
- use of flaps
- ground surface and gradient

35 In flight
- relationship between power required and power available
- performance diagram
- maximum rate and maximum angle of climb
- range and endurance
- effects of configuration, mass, temperature and altitude
- reduction of performance during climbing turns
- gliding
- adverse effects
  - icing, rain
  - condition of the airframe
  - effect of flap

HUMAN PERFORMANCE AND LIMITATIONS

Basic physiology

36 Concepts
- composition of the atmosphere
- the gas laws
- respiration and blood circulation

37 Effects of partial pressure
- effect of increasing altitude
- gas transfer
- hypoxia
  - symptoms
  - prevention
- cabin pressurisation
- effects of rapid decompression
  - time of useful consciousness
  - the use of oxygen masks and rapid descent
- hyperventilation
  - symptoms
  - avoidance
- effects of accelerations

38 Vision
- physiology of vision
- limitations of the visual system
  - vision defects
  - optical illusions
  - spatial disorientation
  - avoidance of disorientation

39 Hearing
- physiology of hearing
- inner ear sensations
- effects of altitude change
- noise and hearing loss
  - protection of hearing
- spatial disorientation
  - conflicts between ears and eyes
  - prevention of disorientation

40 Motion sickness
- causes
- symptoms
- prevention

41 Flying and health
- medical requirements
- effect of common ailments and cures
  - colds
  - stomach upsets
  - drugs, medicines, and side effects
  - alcohol
  - fatigue
- personal fitness
- passenger care
- scuba diving – precautions before flying

42 Toxic hazards
- dangerous goods
- carbon monoxide from heaters

Basic psychology

43 The information process
- concepts of sensation
- cognitive perception
  - expectancy
  - anticipation
  - habits

44 The central decision channel
- mental workload, limitations
- information sources
  - stimuli and attention
  - verbal communication
- memory and its limitations
- causes of misinterpretation

45 Stress
- causes and effects
- concepts of arousal
- effects on performance
- identifying and reducing stress

46 Judgement and decision making
- concepts of pilots' judgement
- psychological attitudes
  - behavioural aspects
- risk assessment
  - development of situational awareness

METEOROLOGY

47 The atmosphere
- composition and structure
- vertical divisions

48 Pressure, density and temperature
- barometric pressure, isobars
- changes of pressure, density and temperature with altitude
- altimetry terminology
- solar and terrestrial energy radiation, temperature
- diurnal variation of temperature
- adiabatic process
- temperature lapse rate
- stability and instability
- effects of radiation, advection subsidence and convergence

49 Humidity and precipitation
- water vapour in the atmosphere
- vapour pressure
- dew point and relative humidity
- condensation and vaporisation
- precipitation

50 Pressure and wind
- high and low pressure areas
- motion of the atmosphere, pressure gradient
- vertical and horizontal motion, convergence, divergence
- surface and geostrophic wind
- effect of wind gradient and windshear on take-off and landing
- relationship between isobars and wind, Buys Ballot's law
- turbulence and gustiness
- local winds, föhn, land and sea breezes

51 Cloud formation
- cooling by advection, radiation and adiabatic expansion
- cloud types
  - convection clouds
  - orographic clouds
  - stratiform and cumulus clouds
- flying conditions in each cloud type

52 Fog, mist and haze
- radiation, advection, frontal, freezing fog
- formation and dispersal
- reduction of visibility due to mist, snow, smoke, dust and sand
- assessment of probability of reduced visibility
- hazards in flight due to low visibility, horizontal and vertical

53 Airmasses
- description of and factors affecting the properties of airmasses
- classification of airmasses, region of origin
- modification of airmasses during their movement
- development of low and high pressure systems
- weather associated with pressure systems

54 Frontology
- formation of cold and warm fronts

– boundaries between airmasses
– development of a warm front
– associated clouds and weather
– weather in the warm sector
– development of a cold front
– associated clouds and weather
– occlusions
– associated clouds and weather
– stationary fronts
– associated clouds and weather

55 Ice accretion
– conditions conducive to ice formation
– effects of hoar frost, rime ice, clear ice
– effects of icing on aeroplane performance
– precautions and avoidance of icing conditions
– powerplant icing
– precautions, prevention and clearance of induction and carburettor icing

56 Thunderstorms
– formation – airmass, frontal, orographic
– conditions required
– development process
– recognition of favourable conditions for formation
– hazards for aeroplanes
– effects of lightning and severe turbulence
– avoidance of flight in the vicinity of thunderstorms

57 Flight over mountainous areas
– hazards
– influence of terrain on atmospheric processes
– mountain waves, windshear, turbulence, vertical movement, rotor effects, valley winds

58 Climatology
– general seasonal circulation in the troposphere over Europe
– local seasonal weather and winds

59 Altimetry
– operational aspects of pressure settings
– pressure altitude, density altitude
– height, altitude, flight level
– ICAO standard atmosphere
– QNH, QFE, standard setting
– transition altitude, layer and level

60 The meteorological organisation
– aerodrome meteorological offices
– aeronautical meteorological stations
– forecasting service
– meteorological services at aerodromes
– availability of periodic weather forecasts

61 Weather analysis and forecasting
– weather charts, symbols, signs
– significant weather charts
– prognostic charts for general aviation

62 Weather information for flight planning

– reports and forecasts for departure, en-route, destination and alternate(s)
– interpretation of coded information METAR, TAF, GAFOR
– availability of ground reports for surface wind, windshear, visibility

63 Meteorological broadcasts for aviation
– VOLMET, ATIS, SIGMET

NAVIGATION

64 Form of the earth
- axis, poles
- meridians of longitude
- parallels of latitude
- great circles, small circles, rhumb lines
- hemispheres, north/south, east/west

65 Mapping
- aeronautical maps and charts (topographical)
- projections and their properties
- conformality
- equivalence
- scale
- great circles and rhumb lines

66 Conformal orthomorphic projection (ICAO 1.500,000 chart)
- main properties
- construction
- convergence of meridians
- presentation of meridians, parallels, great circles and rhumb lines
- scale, standard parallels
- depiction of height

67 Direction
- true north
- earth's magnetic field, variation – annual change
- magnetic north
- vertical and horizontal components
- isogonals, agonic lines

68 Aeroplane magnetism
- magnetic influences within the aeroplane
- compass deviation
- turning, acceleration errors
- avoiding magnetic interference with the compass

69 Distances
- units
- measurement of distance in relation to map projection

70 Charts in practical navigation
- plotting positions
- latitude and longitude
- bearing and distance
- use of navigation protractor
- measurement of tracks and distances

71 Chart reference **material/map reading**
- map analysis
- topography
- relief
- cultural features
  - permanent features (e.g. line features, spot features, unique or special features)
  - features subject to change (e.g. water)
- preparation
- folding the map for use

- methods of map reading
- map orientation
- checkpoint features
- anticipation of checkpoints
  - with continuous visual contact
  - without continuous visual contact
  - when uncertain of position
- aeronautical symbols
- aeronautical information
- conversion of units

72 Principles of navigation

- IAS, CAS and TAS
- track, true and magnetic
- wind velocity, heading and groundspeed
- triangle of velocities
- calculation of heading and groundspeed
- drift, wind correction angle
- ETA
- dead reckoning, position, fix

73 The navigation computer

- use of the circular slide rule to determine
  - TAS, time and distance
  - conversion of units
  - fuel required
  - pressure, density and true altitude
  - time en-route and ETA
  - use of the computer to solve triangle of velocities
  - application of TAS and wind velocity to track
  - determination of heading and ground speed
  - drift and wind correction angle

74 Time

- relationship between universal co-ordinated (standard) (UTC) time and local mean time (LMT)
- definition of sunrise and sunset times

75 Flight planning

- selection of charts
- route and aerodrome weather forecasts and reports
- assessing the weather situation
- plotting the route
- considerations of controlled/regulated airspace, airspace restrictions, danger areas, etc.
- use of AIP and NOTAMS
- ATC liaison procedures in controlled/regulated airspace
- fuel considerations
- en-route safety altitude(s)
- alternate aerodromes
- communications and radio/navaid frequencies
- compilation of flight log
- compilation of ATC flight plan
- selection of check points, time and distance marks
- mass and balance calculations
- mass and performance calculations

76 Practical navigation

- compass headings, use of deviation card
- organisation of in-flight workload
- departure procedure, log entries, altimeter setting and establishing IAS
- maintenance of heading and altitude
- use of visual observations
- establishing position, checkpoints
- revisions to heading and ETA
- arrival procedures, ATC liaison
- completion of flight log and aeroplane log entries

Radio navigation

77 Ground D/F
- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

78 ADF, including associated beacons (NDBs) and use of the RMI
- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

79 VOR/DME
- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting range and accuracy

80 GPS
- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting reliability and accuracy

81 Ground radar
- application
- principles
- presentation and interpretation
- coverage
- errors and accuracy
- factors affecting reliability and accuracy

82 Secondary surveillance radar
- principles (transponders)
- application
- presentation and interpretation
- modes and codes

OPERATIONAL PROCEDURES

83 ICAO Annex 6, Part II – Operation of aircraft
- foreword
- definitions
- general statement
- flight preparation and in-flight procedures
- performance and operating limitations
- instruments and equipment
- communications and navigation equipment
- maintenance
- flight crew
- lights to be displayed

84 ICAO Annex 12 – Search and rescue
- definitions
- alerting phases
- procedures for pilot-in-command (para 5.8 and 5.9)
- search and rescue signals (para 5.9 and Appendix A)

85 ICAO Annex 13 – Aircraft accident investigation
- definitions
- national procedures

86 Noise abatement
- general procedures
- application to take-off and landing

87 Contravention of aviation regulations
- offences
- penalties

PRINCIPLES OF FLIGHT

88 The atmosphere
- composition and structure
- ICAO standard atmosphere
- atmospheric pressure

89 Airflow around a body, sub-sonic
- air resistance and air density
- boundary layer
- friction forces
- laminar and turbulent flow
- Bernoulli's principle – venturi effect

90 Airflow about a two dimensional aerofoil
- airflow around a flat plate
- airflow around a curved plate (aerofoil)
- description of aerofoil cross section
- lift and drag
- C_l and C_d and their relationship to angle of attack

91 Three dimensional flow about an aerofoil
- aerofoil shapes and wing planforms
- induced drag
  - downwash angle, vortex drag, ground effect
  - aspect ratio
- parasite (profile) drag
  - form, skin friction and interference drag
- lift/drag ratio

92 Distribution of the four forces
- balance and couples
- lift and mass
- thrust and drag
- methods of achieving balance

93 Flying controls
- the three planes
  - pitching about the lateral axis
  - rolling about the longitudinal axis
  - yawing about the normal axis
- effects of the elevators (stabilators), ailerons and rudder
- control in pitch, roll and yaw
- cross coupling, roll and yaw
- mass and aerodynamic balance of control surfaces

94 Trimming controls
- basic trim tab, balance tab and anti-balance tab
- purpose and function
- method of operation

95 Flaps and slats
- simple, split, slotted and Fowler flaps
- purpose and function
- operational use
- slats, leading edge
- purpose and function
- normal/automatic operation

96 The stall
- stalling angle of attack
- disruption of smooth airflow
- reduction of lift, increase of drag
- movement of centre of pressure
- symptoms of development
- aeroplane characteristics at the stall
- factors affecting stall speed and aeroplane behaviour at the stall
- stalling from level, climbing, descending and turning flight
- inherent and artificial stall warnings
- recovery from the stall

97 Avoidance of spins
- wing tip stall
- the development of roll
- recognition at the incipient stage
- immediate and positive stall recovery

98 Stability
- definitions of static and dynamic stability
- longitudinal stability
- centre of gravity effect on control in pitch
- lateral and directional stability
- interrelationship, lateral and directional stability

99 Load factor and manoeuvres
- structural considerations
- manoeuvring and gust envelope
- limiting load factors, with and without flaps
- changes in load factor in turns and pull-ups
- manoeuvring speed limitations
- in-flight precautions

100 Stress loads on the ground
- side loads on the landing gear
- landing
- taxying, precautions during turns

COMMUNICATIONS

101 Radio telephony and communications
- use of AIP and frequency selection
- microphone technique
- phonetic alphabet
- station/aeroplane callsigns/abbreviations
- transmission technique
- use of standard words and phrases
- listening out
- required 'readback' instructions

102 Departure procedures
- radio checks
- taxi instructions
- holding on ground
- departure clearance

103 En-route procedures
- frequency changing
- position, altitude/flight level reporting
- flight information service
- weather information
- weather reporting
- procedures to obtain bearings, headings, position
- procedural phraseology
- height/range coverage

104 Arrival and traffic pattern procedures
- arrival clearance
- calls and ATC instructions during the:
  - circuit
  - approach and landing
  - vacating runway

105 Communications failure
- Action to be taken
  - alternate frequency
  - serviceability check, including microphone and headphones
- in-flight procedures according to type of airspace

106 Distress and urgency procedures
- distress (Mayday), definition and when to use
- frequencies to use
- contents of Mayday message
- urgency (Pan), definition and when to use
- frequencies to use
- relay of messages
- maintenance of silence when distress/urgency calls heard
- cancellation of distress/urgency

General flight safety

107 Aeroplane
- seat adjustment and security
- harnesses and seat belts
- emergency equipment and its use

- fire extinguisher
- engine/cabin fires
- de-icing systems
- survival equipment, life jackets, life rafts

– carbon monoxide poisoning
– refuelling precautions
– flammable goods/pressurised containers

108 Operational

– wake turbulence
– aquaplaning
– windshear, take-off, approach and landing
– passenger briefings
– emergency exits
– evacuation from the aeroplane
  - forced landings
  - gear-up landing
  - ditching

2. SYLLABUS

OF

FLIGHT INSTRUCTION

FOR

THE

PRIVATE PILOT LICENCE

(AEROPLANE)

PPL(A)

ENTRY TO TRAINING

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

Exercise 1 Familiarisation with the aeroplane

- characteristics of the aeroplane
- cockpit layout
- systems
- check lists, drills, controls

Exercise 1E Emergency drills

- action in the event of fire on the ground and in the air
- engine cabin and electrical system fire
- systems failure
- escape drills, location and use of emergency equipment and exits

Exercise 2 Preparation for and action after flight

- flight authorisation and aeroplane acceptance
- serviceability documents
- equipment required, maps, etc.
- external checks
- internal checks
- harness, seat or rudder panel adjustments
- starting and warm up checks
- power checks
- running down system checks and switching off the engine
- parking, security and picketing (e.g. tie down)
- completion of authorisation sheet and serviceability documents

Exercise 3 Air experience

- flight exercise

Exercise 4 Effects of controls

- primary effects when laterally level and when banked
- further effects of aileron and rudder
- effects of:
  - airspeed
  - slipstream
  - power
  - trimming controls
  - flaps
  - other controls, as applicable
- operation of:
  - mixture control
  - carburettor heat
  - cabin heating/ventilation
- airmanship

Exercise 5 Taxiing

- pre-taxi checks
- starting, control of speed and stopping
- engine handling
- control of direction and turning
- turning in confined spaces
- parking area procedure and precautions
- effects of wind and use of flying controls

- effects of ground surface
- freedom of rudder movement
- marshalling signals
- instrument checks
- air traffic control procedures
- airmanship

Exercise 5E Emergencies

- Brake and steering failure

Exercise 6 Straight and level

- at normal cruising power, attaining and maintaining straight and level flight
- flight at critically high airspeeds
- demonstration of inherent stability
- control in pitch, including use of trim
- lateral level, direction and balance, trim
- at selected airspeeds (use of power)
- during speed and configuration changes
- use of instruments for precision
- airmanship

Exercise 7 Climbing

- entry, maintaining the normal and max rate climb, levelling off
- levelling off at selected altitudes
- en-route climb (cruise climb)
- climbing with flap down
- recovery to normal climb
- maximum angle of climb
- use of instruments for precision
- airmanship

Exercise 8 Descending

- entry, maintaining and levelling off
- levelling off at selected altitudes
- glide, powered and cruise descent (including effect of power and airspeed)
- side slipping (or suitable types)
- use of instruments for precision flight
- airmanship

Exercise 9 Turning

- entry and maintaining medium level turns
- resuming straight flight
- faults in the turn – (in correct pitch, bank, balance)
- climbing turns
- descending turns
- slipping turns (or suitable types)
- turns onto selected headings, use of gyro heading indicator and compass
- use of instruments for precision
- airmanship

Exercise 10A Slow flight

NOTE: The objective is to improve the student's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane in balance while returning to normal airspeed.

- safety checks
- introduction to slow flight
- controlled flight down to critically slow airspeed
- application of full power with correct attitude and balance to achieve normal climb speed
- airmanship

Exercise 10B Stalling

- airmanship
- safety checks
- symptoms
- recognition
- clean stall and recovery without power and with power
- recovery when a wing drops
- approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage

Exercise 11 Spin avoidance

- airmanship
- safety checks
- stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°)
- instructor induced distractions during the stall

NOTE 1: At least two hours of stall awareness and spin avoidance flight training shall be completed during the course.

NOTE 2: Consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance calculations.

Exercise 12 Take-off and climb to downwind position

- pre-take-off checks
- into wind take-off
- safeguarding the nosewheel
- crosswind take-off
- drills during and after take-off
- short take-off and soft field procedure/techniques including performance calculations
- noise abatement procedures
- airmanship

Exercise 13 Circuit, approach and landing

- circuit procedures, downwind, base leg
- powered approach and landing
- safeguarding the nosewheel
- effect of wind on approach and touchdown speeds, use of flaps
- crosswind approach and landing
- glide approach and landing
- short landing and soft field procedures/techniques
- flapless approach and landing
- wheel landing (tail wheel aeroplanes)
- missed approach/go around
- noise abatement procedures
- airmanship

Exercise 12/13E Emergencies

- abandoned take-off
- engine failure after take-off
- mislanding/go-around
- missed approach

In the interests of safety it will be necessary for pilots trained on nosewheel aeroplanes to undergo dual conversion training before flying tail wheel aeroplanes, and vice-versa.

Exercise 14 First solo

- instructor's briefing, observation of flight and de-briefing

NOTE: During flights immediately following the solo circuit consolidation the following should be revised.

- procedures for leaving and rejoining the circuit
- the local area, restrictions, map reading
- use of radio aids for homing
- turns using magnetic compass, compass errors
- airmanship

Exercise 15 Advanced turning

- steep turns (45°), level and descending
- stalling in the turn and recovery
- recoveries from unusual attitudes, including spiral dives
- airmanship

Exercise 16 Forced landing without power

- forced landing procedure
- choice of landing area, provision for change of plan
- gliding distance
- descent plan
- key positions
- engine cooling
- engine failure checks
- use of radio
- base leg
- final approach
- landing
- actions after landing
- airmanship

Exercise 17 Precautionary landing

- full procedure away from aerodrome to break-off height
- occasions necessitating
- in-flight conditions
- landing area selection
  - normal aerodrome
  - disused aerodrome
  - ordinary field
- circuit and approach
- actions after landing
- airmanship

Exercise 18A Navigation

Flight planning
- weather forecast and actuals
- map selection and preparation
  - choice of route
  - controlled airspace
  - danger, prohibited and restricted areas
  - safety altitudes
- calculations
  - magnetic heading(s) and time(s) en-route
  - fuel consumption
  - mass and balance
  - mass and performance
- flight information
  - NOTAMS etc.
  - radio frequencies
  - selection of alternate aerodromes
- aeroplane documentation
- notification of the flight
  - pre-flight administrative procedures
  - flight plan form

Departure
- organisation of cockpit workload
- departure procedures
  - altimeter settings
  - ATC liaison in controlled/regulated airspace
    - setting heading procedure
  - noting of ETAs
- maintenance of altitude and heading
- revisions of ETA and heading
- log keeping
- use of radio
- use of navaids
- minimum weather conditions for continuation of flight
- in-flight decisions
- transiting controlled/regulated airspace
- diversion procedures
- uncertainty of position procedure
- lost procedure

Arrival, aerodrome joining procedure
  - ATC liaison in controlled/regulated airspace
  - altimeter setting
  - entering the traffic pattern
  - circuit procedures
- parking
- security of aeroplane
- refuelling
- closing of flight plan, if appropriate
- post-flight administrative procedures

Exercise 18B Navigation problems at lower levels and in reduced visibility

- actions prior to descending
- hazards (e.g. obstacles, and terrain)
- difficulties of map reading
- effects of wind and turbulence
- avoidance of noise sensitive areas

- joining the circuit
- bad weather circuit and landing

Exercise 18C Radio navigation

Use of VHF Omni Range
- availability, AIP, frequencies
- selection and identification
- omni bearing selector (OBS)
- to/from indications, orientation
- course deviation indicator (CDI)
- determination of radial
- intercepting and maintaining a radial
- VOR passage
- obtaining a fix from two VORs

Use of automatic direction finding equipment (ADF) – non-directional beacons (NDBs)
- availability, AIP, frequencies
- selection and identification
- orientation relative to the beacon
- homing

Use of VHF direction finding (VHF/DF)
- availability, AIP, frequencies
- R/T procedures and ATC liaison
- obtaining a QDM and homing

Use of en-route/terminal radar
- availability, AIP
- procedures and ATC liaison
- pilot's responsibilities
- secondary surveillance radar
  - transponders
  - code selection
  - interrogation and reply

Use of distance measuring equipment (DME)
- station selection and identification
- modes of operation
  - distance, groundspeed, time to run

Exercise 19 Basic instrument flight

- physiological sensations
- instrument appreciation
  - attitude instrument flight
- instrument limitations
- airmanship
- basic manoeuvres
  - straight and level at various airspeeds and configurations
  - climbing and descending
  - standard rate turns, climbing and descending, onto selected headings
  - recoveries from climbing and descending turns

IEM FCL 1.135

PPL(A) skill test form

See JAR–FCL 1.135

APPLICATION AND REPORT FORM for the PPL(A) skill test

Applicant's last name:		First name:	

1	**Details of the flight**		
Type of aeroplane:		Departure aerodrome:	
Registration:		Destination aerodrome:	
Block time off:		Block time on:	
Total block time:		Take-off time:	
Landing time:			

2	**Result of the test** *delete as necessary		
Passed*		Failed *	Partial pass *

3	**Remarks**

Location and date:		Type and number of FE's licence:	
Signature of FE:		Name of FE, in capitals:	