Safety and Airspace Regulation Group

Flight Crew Standards

Standards Document 10 (Aeroplanes) Version 7

Guidance for:

- **Instructors**
- **Instructor trainers**
- **Flight Instructor Examiners (FIE)**

Assessment of Competence for Instructor Certification

EASA Aircrew Regulation
Annex 1 – Part-FCL
Subpart J

CONTENTS

Foreword

Standards Document 10 (Aeroplanes) has been compiled by the CAA Flight Crew Standards team. Its purpose is to provide information on the assessment of competence of instructors for EASA Part-FCL instructor certificates, specifically:

- The Flight Instructor (FI) Certificate;
- The Class Rating Instructor (CRI) Certificate;
- The Instrument Rating Instructor (IRI) Certificate;
- The Synthetic Training Instructor (STI) Certificate.

This document includes guidance on the manner in which assessments of competence should be conducted, the criteria against which instructor competence should be assessed and information regarding the administrative procedures for the issue, revalidation and renewal of instructor certificates and their variation to include additional instructional privileges. Additionally, it provides guidance to those who train instructors (Flight Instructor Course instructors or FIC) and those who assess the competence of instructors (Flight Instructor Examiners or FIE).

By providing a standard reference document for instructors, instructor trainers and instructor examiners, it aims to ensure that assessments of competence are conducted in a uniform, impartial and reliable manner and that the highest standards of instructional competence are maintained.

This Standards Document should be used in conjunction with the following documents:

a. EASA Part-FCL, particularly Subpart J and the associated Guidance Material (GM) and Acceptable Means of Compliance (AMC);

b. UK CAA Forms SRG 1131, 1133, 1135 and 1169 (application forms for the issue, revalidation and renewal of instructor certificates and for variation of instructor privileges, and the examiner's report form/assessment schedule);

c. The JAA/EASA Flight Examiners' Manual, available at www.jaa.nl/licensing/flight_examiners_manual.html.

d. The CAA Flight Examiners Handbook (FEH).

The Civil Aviation Authority is the competent authority of the UK for the issue of pilot licences, ratings and certificates in accordance with the Aircrew Regulation (Commission Regulation (EU) 1178/2011 as amended) and for the oversight of their implementation and use. In fulfilling this role, the CAA is required to provide oversight documentation, including standards documents, guidance material and acceptable means of compliance that may be used by relevant personnel and organisations to allow them to perform their tasks, discharge their responsibilities and establish compliance with the Basic Regulation (Commission Regulation (EU) 216/2008).

Nothing in this document is intended to conflict with EASA Regulations or UK statute law where applicable. Whilst every effort is made to ensure that all information is correct at the time of publication, the CAA reserves the right to amend this document as required to accommodate changes to the primary authority documents, to correct errors and omissions or to reflect changes in national policy and best practice.

Throughout this Document the following editorial practices and definitions shall apply:

- "Shall" and "Must" are used to indicate a mandatory requirement.
- "Expect" and "Should" are used to indicate strong obligation.
- "May" is used to indicate discretion.
- "Examiner" is used to indicate a person who holds a valid examiner authorisation certificate issued by the competent authority of an EASA member state and, where the certificate was not issued by the UK CAA, has received a briefing from the UK CAA in accordance with FCL.1015.

- "Applicant" is used to indicate a person who is seeking the issue, revalidation or renewal of a pilot licence, certificate or certificate.
- "He/She" The pronoun 'he' is used throughout for ease of reading.

This document and other Civil Aviation Authority (CAA) Standards and Guidance Documents are available on the CAA web site www.caa.co.uk and can be downloaded to users without charge. The CAA Scheme of Charges and application and report forms are also available from the website.

If, after reading this document, there are any queries or comment, please contact CAA Flight Crew Standards at the CAA Safety and Airspace Regulation Group.

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Changes to Version 7

The most significant change to Standards Document 10 v7 are changes to the various sections comprising an instructor Assessment of Competence and the redefinition of what constitutes a Pass, Partial Pass or Fail. Previous CAA practice (under National procedures and JAR-FCL) was to list 7 Sections for an instructor rating test or check, with Section 4 comprising "Mandatory Items" and Section 6 comprising "Instrument Exercises". Additionally, advice to examiners on how to assess the result and which particular sections and items to retest in the event of a Partial Pass or Fail was based on the inclusion of 7 Sections in the test/check. This practise has been revised to be compatible with Part-FCL and in particular FCL.935, AMC1 FCL.935, AMC3 FCL.935 and AMC5 FCL.935.

The example schedule for an instructor assessment of competence at AMC3 FCL.935 comprises 5 sections and significantly there are no separate sections for "Mandatory Items" and "Instrument Exercises". The CAA examiner's report form SRG 1169 will be amended in due course to reflect this, most likely to coincide with the development of an online electronic form. Until such time, examiners should continue to use the current version of the form but are directed towards paragraphs 7.8 and 10 of this document for guidance on the content and assessment of an instructor AoC.

AMC1 FCL.935 states that, "In principle, failure in any exercise requires a retest in all exercises, with the exception of those that may be retaken separately." The example application and report form at AMC5 FCL.935 suggests that the AoC may result in a Partial Pass if either Section 1, the theoretical knowledge oral is failed and all other sections are passed, or alternatively if Section 1 is passed but one of the other sections comprising the flight exercises is failed. Therefore, guidance in paragraph 10 of this Document on Pass, Partial Pass and Fail criteria has been amended accordingly.

Otherwise Standards Document 10 version 7 mostly comprises editorial changes resulting from organisational changes at the CAA since the publication of v6. For example, where previously the CAA Staff Flight Examiners worked within CAA Safety Regulation Group, Flight Crew Licensing department, Licensing and Training Standards (L&TS); the organisation now comprises CAA Safety and Airspace Regulation Group (SARG), Flight Crew Standards. Similarly, where previously application and report forms were submitted to L&TS at SRG for processing, they should now be submitted to the Shared Service Centre at SARG.

Glossary of Abbreviations and Terms

AI or ADI	Attitude Indicator or Attitude Direction Indicator
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AMC	Acceptable means of compliance
ANO	Air Navigation Order
ATC	Air Traffic Control
ATO	Approved Training Organisation
ATPL	Airline Transport Pilots Licence
CDFA	Continuous Descent Final Approach
CPL	Commercial Pilot Licence
CRE	Class Rating Examiner
CRE/IRR	Class Rating Examiner with Instrument Rating Revalidation/Renewal Privileges
CRI	Class Rating Instructor
CRM	Crew Resource Management
CRMI	Crew Resource Management Instructor
DA/H	Decision Altitude/Height
EFATO	Engine Failure After Take-off
EU-OPS	European Union Requirements - Commercial Air Transport (Aeroplanes)
FCS	Flight Crew standards

FEH	Flight Examiners Handbook
FE (CPL)	Flight Examiner Commercial Pilot Licence (Aeroplanes)
FE (PPL)	Flight Examiner Private Pilot Licence (Aeroplanes)
FI	Flight Instructor
FIC	Flight Instructor Course instructor
FIE	Flight Instructor Examiner
FNPT or FNPT II	Flight Navigation Procedures Trainer
FS or FFS	Flight Simulator or Full Flight Simulator
FSTD	Flight Simulation Training Device
FTO	Flight Training Organisation
GE	Ground Examiner
HPA	High Performance Aeroplane
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IR	Instrument Rating
IRI	Instrument Rating Instructor
LPC	Licensing Proficiency Check
LST	Licensing Skill Test
LTS	Licensing and Training Standards
MDA/H	Minimum Descent Altitude/Height
ME	Multi-Engine
MEP	Multi-Engine Piston Aeroplane
MP or MPA	Multi-Pilot or Multi-Pilot Aeroplane
OPC	Operator Proficiency Check
RF	Registered Facility
RT or RTF	Radiotelephony
RTC	Regional Test Centre
RTO	Rejected Take-off
SE (A)	Single-Engine Aeroplane
SE	Senior Examiner
SEP	Single-Engine Piston Aeroplane
SET	Single-Engine Turboprop Aeroplane
Skill Test	Demonstration of skill for the issue of a licence or rating
SP or SPA	Single-Pilot or Single-Pilot Aeroplane
SP HPCA	Single-pilot high performance complex aeroplane
TMG	Touring Motor Glider
TRE	Type Rating Examiner
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

1. Administrative Arrangements

1.1 The assessment of competence (AoC) for the initial award of an instructor certificate is made upon completion of a course of training at an approved training organisation (ATO). The assessment shall be taken within 6 months of the completion of training and all relevant exercises of the assessment must be completed within 6 months (of the first attempt).

1.2 Applicants for an instructor certificate must have completed all of the requirements for issue of the certificate before undertaking the AoC. Training records shall be made available to the examiner. In addition the training organisation must confirm the applicant's readiness for the assessment by completion of a Course Completion Certificate.

1.3 Applicants should be in possession of a medical certificate at the time of the AoC. If the certificate is out of date the examiner may still conduct the assessment, but the applicant should be aware that, regardless of the outcome, an Instructor Certificate will not be issued until the applicant obtains a valid medical certificate.

1.4 Examiners are not normally designated for initial instructor AoC by the CAA Flight Test Bookings Cell. However, the CAA reserves the right to designate a Staff FE for the purposes of ATO oversight and sampling activity. Notwithstanding that ATO, applicants and examiners may liaise directly when arranging an AoC. Examiners are reminded they shall not conduct the assessment of competence for an instructor certificate when they have provided flight instruction to the applicant for that certificate, or, been responsible for recommending the applicant for the assessment of competence, or, if they feel their objectivity may be affected. (Note: examples of a situation where the examiner should consider if his/her objectivity is affected include when the applicant is a relative or a friend of the examiner, or when they are linked by economical interests or political affiliations, etc).

1.5 For AoC for the revalidation or renewal of instructor certificates, the applicant normally liaises directly with the examiner. When arranging any assessment, examiners will discuss and agree items such as:

(a) Date, time and place for the assessment;
(b) Provision of a suitably equipped aeroplane with appropriate insurance cover;
(c) Agreement on a suitable subject for the long brief (to be advised at least 2 days before the AoC);
(d) Availability of training records, course completion certificates, test forms and aircraft documents;
(e) Flight test fees and expenses including arrangements in case of cancellation. The CAA Scheme of Charges sets the fees to be charged for checks and tests conducted by Staff Flight Examiners. Authorised examiners may determine an appropriate fee for their services including reasonable recompense for travel expenses.

1.6 Examiners should use the opportunity of the AoC to emphasise points of standardisation notified through examiner and instructor refresher seminars. Additionally and where appropriate, reference should be made to flight safety information and publications such Safety Sense Leaflets, Standards Documents, CAA Safety and Information Notices and the “Clued Up” magazine.

1.7 In accordance with AMC1 FCL.930, the UK CAA also requires that, for the initial issue of an FI certificate, all instructors demonstrate the ability to teach the recognition of and recovery from a full spin. Where the applicant has already completed this requirement (see also paragraph 7.11 below), he must present evidence of such to the examiner who conducts the main AoC. Instruction in spinning is not required for CRI, IRI or STI but may be considered an appropriate exercise to include on a CRI AoC where the applicant intends to use the privileges to instruct for the aerobatic rating.

2. Aerodrome

2.1 Under the provisions of ANO 2009 Article 208, instruction in flying and the carrying out of flight assessments may take place at an unlicensed aerodrome if using an aeroplane with a maximum total weight authorised not exceeding 2730 kg or helicopters/gyroplanes with a maximum total weight authorised not exceeding 3175 kg. However, it is a condition of Article 208A that both the operator of such an aerodrome and the commander of the aircraft are satisfied on reasonable grounds that the aerodrome has adequate facilities for the safe conduct of such flights. CAP 793, Safe Operating Practices at Unlicensed Aerodromes, contains guidance on what constitute adequate facilities. Examiners must satisfy themselves that aerodromes are suitable for the conduct of flight assessment and should not undertake a flight assessment where it is apparent that the guidance in CAP 793 has not been met.

3. Provision of Aeroplanes

3.1 The aeroplanes used for flight training for instructor certificates must meet the requirements of OR.ATO.135 which are further amplified in CAA Standards Document 55. It is assumed that these aeroplanes will be used for the AoC upon completion of an approved course of training. Where assessments are conducted away from an approved training organisation, for example for the revalidation or renewal of instructor certificates, the examiner must be satisfied that the aeroplane is appropriately certified, insured, suitably equipped, has been correctly maintained, is serviceable and capable of safely performing all of the air exercises and manoeuvres required of the AoC.

3.2 Where the assessment requires manoeuvres such as spinning and aerobatics, the pilot's operating handbook or aircraft flight manual must indicate that such manoeuvres are permitted and the aircraft must be operated at all times within any limitations specified for such manoeuvres.

3.3 For multi engine instructor training and assessment the aeroplane must be capable of having the propellers feathered and un-feathered. The aircraft performance must enable a positive climb gradient from take-off safety speed at normal training weights, with all necessary drag removed and the critical engine set for zero thrust in ISA conditions.

4. Instructor Competencies and Assessment Profile

2.1 This part is common to all instructor AoC and the general format shall be followed for the initial issue, revalidation, renewal or variation of all instructor certificates.

2.2 All instructors shall be trained and assessed in the following competences (FCL.920):

(a) Prepare resources,
(b) Create a climate conducive to learning,
(c) Present knowledge,
(d) Integrate Threat and Error Management (TEM) and crew resource management (CRM),
(e) Manage time to achieve training objectives,
(f) Facilitate learning,
(g) Assess trainee performance,
(h) Monitor and review progress,
(i) Evaluate training sessions,
(j) Report outcome.

4.3 The instructor assessment of competence is divided into five main sections as follows:

Section 1	Theoretical Knowledge
Section 2	Pre-Flight Briefing
Section 3	Flight
Section 4	Multi Engine (where applicable)
Section 5	Post Flight Debriefing

4.4 An instructor AoC is intended to be conducted in its entirety on one day. However, in extenuating circumstances and if agreed between the applicant and the examiner it may be continued into a second day. If the assessment is completed in two parts, both parts should

be conducted by the same examiner. The overall result should not be assessed or recorded until all sections have been completed, unless the applicant's performance is clearly below standard, in which case the AoC may be terminated by the examiner. Examiners and applicants must expect that the complete assessment, including ground briefings and oral, may take 4 to 6 hours. Therefore, examiners should only plan to assess one applicant per day. There must be no attempt to pressure the applicant into hurried actions, nor for the examiner to omit or cut short the assessment of required items. All relevant exercises must be completed within 6 months.

4.5 The typical sequence in which the assessment will normally be conducted (with approximate durations for an initial issue) are:

(a) Administration and examiner's brief - 30 minutes
(b) Pre-Flight Briefing (Section 2) - 30 minutes
(c) Flight (Section 3 and additional exercises as required) - 90 minutes
(d) Post Flight Debrief (Section 5) - 10 minutes
(e) Lunch
(f) Long briefing and theoretical knowledge (Section 1) - 2 hours
(g) Examiners debrief and administration - 30 minutes

5. Administration and the Examiner's Brief

5.1 At the pre-arranged time the examiner will meet the applicant for the opening briefing. The applicant should have the following documents and equipment available:

(a) Personal flying logbook
(b) Medical certificate
(c) Licence
(d) A form of identity including a photograph; e.g. a valid passport, driver's licence or ID card
(e) A valid Certificate of Course Completion
(f) Aircraft documents
(g) Two headsets (examiners normally carry their own headset but a spare unit should be available for the flight)
(h) Two copies of the aircraft check list
(i) Instrument flying screens, hood, visor or goggles (as applicable)
(j) Planning materials including maps and charts and a blank PLOG
(k) A stopwatch or timepiece
(l) Any relevant CAA correspondence such as a letter of assessment or retraining requirements
(m) If a seminar has been attended for revalidation or renewal of an instructor certificate, the applicant must present the attendance certificate as evidence of attendance.

5.2 Having established that the applicant has completed the required training, meets the experience requirements and is prepared for the AoC, the examiner will give a comprehensive briefing covering all aspects of the assessment. During the briefing the applicant is encouraged to ask questions at any time, particularly if unclear about what is required. The examiner must make every effort to put the applicant at ease and ensure that the content and format of the assessment is fully understood.

5.3 The examiner will outline the sections of the test to be completed, perhaps with reference to the Examiner's Record and Report Form (SRG 1169), and outline a plan for the day's activities. The examiner's brief will include the following:

5.4 The purpose of the flight is for the applicant to demonstrate his ability to give instruction on the ground and in the air and to train a student pilot to the standard required for the issue of a licence, rating or certificate as appropriate to role. Throughout the assessment the examiner will be looking for evidence of the following competencies:

(a) Ability as an Instructor to impart knowledge and skill, both on the ground and in the air;

(b) Personal flying ability, captaincy and airmanship (accuracy of demonstrations, efficient use of airspace and time, flight management skills, lookout etc);

(c) The practical application of resource management and threat & error management;

(d) Knowledge and understanding of the standard teaching exercises and their sequence within a training syllabus;

(e) Involving and engaging the student in all aspects of the flight;

(f) Technical knowledge;

(g) Recognition, analysis and correction of typical student faults

(h) Ability to facilitate and conduct an effective debriefing.

5.5 The examiner will outline the various roles and responsibilities. In essence, although the examiner is actually the pilot in command and ultimately responsible for the safe conduct of the flight, the applicant is to assume the role of PIC. He is expected to carry out all of the duties of the PIC and make all necessary decisions for the safe, practical and expeditious management of the flight. The examiner should be treated as an average student pilot, with knowledge and skills commensurate with his experience. Unless otherwise briefed, it can be assumed that he has completed all of the syllabus flight and ground exercises prior to the main lesson being taught to a satisfactory standard. Similarly, for any secondary exercises it can be assumed that the student pilot has received the relevant ground instruction and has had time for self study.

5.6 The examiner will explain that throughout the flight the applicant will be expected to use the approved checklist and operate the aircraft in accordance with the flight manual/POH. The applicant may be asked to carry out a pre-flight inspection explaining to the 'student' what he is doing and why. Airborne checks may be completed from memory but must be in accordance with the checklist.

5.7 Applicants will be expected to obtain a weather forecast and interpret whether the weather is suitable for a particular lesson. The decision whether or not to proceed with the assessment rests with the applicant. However, examiners will endeavour to select primary and secondary flight exercises that are appropriate and teachable in the prevailing conditions.

5.8 The applicant is expected to complete all necessary pre-flight planning and preparation including checking the aircraft, choosing a suitable operating area, checking NOTAM, completing a fuel plan, completing mass & balance and performance calculations etc. If requested by the applicant and if appropriate for the lesson, the examiner may assist with planning the flight in role as a student pilot.

5.9 The examiner will explain and ascertain the applicant's understanding of the following definitions to be used throughout the assessment:

If asked to **'demonstrate**' an exercise or manoeuvre the applicant is expected to fly the complete exercise as a pure demonstration of piloting skill.

If asked to **'patter'** an exercise or manoeuvre the applicant is expected to commentate whilst flying the manoeuvre, bringing out and highlighting any relevant teaching points. He is not required to break the exercise down into a lesson or offer the student control to practise.

If asked to **'teach'** an exercise or manoeuvre the applicant is expected to break down the manoeuvre into its' relevant parts and devise a lesson, giving the student time to practise and noting or correcting any faults or errors of technique.

5.10 The examiner will discuss the responsibilities and actions in the event of any actual emergency or abnormal condition during the flight. In general, the handling pilot is to remain at the controls but the examiner, as the aircraft captain, may elect to take control at any stage.

5.11 The management of abnormal situations and the handling of emergencies is a vital skill for pilots but one that in general is poorly taught. Therefore, examiners are encouraged to introduce, as one of the secondary flight exercises, a simulated emergency or abnormal situation as a teaching exercise. The instructor is expected to teach the examiner (as he would teach a student pilot) how to manage the situation, including use of the abnormal

procedures/emergency checklist, the decision making process, ATC liaison, passenger handling etc. Where this involves demonstrating or practising potentially hazardous manoeuvres or procedures, for example simulated engine failures, these should be briefed and discussed before flight.

5.12 Throughout the assessment the examiner may ask practical questions relating to all aspects of the flight, the operation of the aircraft and the process for instructing a trainee pilot towards the applicable licence, rating or certificate. This is a normal process that contributes towards the assessment of Section 1.

5.13 Throughout the assessment it will be necessary for the examiner to make notes to facilitate an accurate, effective and thorough debriefing and in order to complete the report form accurately. Examiners should do this as unobtrusively as possible, explaining that this is normal practice and that it should not give rise to concerns.

5.14 Detailed briefing of the format and conduct of the ground oral examination and long briefing may be left until after the flight exercise.

5.15 The applicant should understand that the final assessment is normally reserved until the end of the assessment and that, as well as individual exercises, the overall performance will be considered. Therefore, applicants should not attempt to judge their own performance or dwell on individual errors or mistakes.

6. Pre-Flight Briefing

6.1 The main or primary flight exercise will be chosen from a representative syllabus, for example from the EASA Part-FCL PPL syllabus for an AoC for an initial FI certificate; from the MEP class rating syllabus for a CRI ME certificate or for the addition of ME instructional privileges to an FI certificate; and from the instrument rating syllabus for an IRI certificate or for the addition of applied instrument instruction privileges to an FI certificate.

6.2 The examiner should be imaginative and flexible over the choice of primary flight exercise, taking into consideration the prevailing weather conditions, geographic location, local facilities, capabilities of the aircraft etc. Instructors must be prepared to teach any exercise from the full scope of the syllabus, and should avoid limiting their preparation to a few, favoured exercises. Examiners likewise should refrain from repeatedly asking applicants to give the same instructional lessons.

6.3 The applicant will be given some time to prepare (approximately 20 minutes) and will then be required to give a pre-flight briefing lasting 20-30 minutes. The normal media for this briefing may be whiteboard, OHP, flipchart or electronic presentations using media such as PowerPoint. It is recommended that applicants check beforehand that appropriate facilities are available at the venue to be used and be prepared, where necessary to adapt their briefing to make best use of the available equipment. Where the main briefing is delivered using electronic media, the examiner may ask for further briefings later in the day using alternative methods (e.g. whiteboard).

6.4 The pre-flight briefing should outline the complete content and sequence of the flight including revision of previous skills or exercises and the content and development of the main lesson including associated airmanship or threat & error management considerations applicable for the stage of training.

6.5 The applicant is expected to display the ability to 'build' a flight exercise in stages using a logical sequence of teaching and learning. Applicants may use any pre-prepared notes or material but must demonstrate a sound knowledge of the lesson rather than read directly from notes. Applicants are expected to periodically check the student's knowledge and understanding and evaluate student progress with appropriate and effective questioning.

6.6 The examiner will to take notes during the briefing and the completed flipchart or whiteboard

presentation should be retained for reference for the subsequent de-briefing.

6.7 Examiners will assess the applicant for:

(a) Visual Presentation and Content

(b) Technical Accuracy

(c) Clarity of Explanation

(d) Clarity of Speech

(e) Instructional Technique

(f) Use of Models and Aids

(g) Student Participation

7. The Flight

7.1 The AoC schedule must include the briefed air exercise as a primary exercise and a sample of additional or secondary exercises. The aim is for the instructor to demonstrate his ability to deliver a full lesson and his knowledge and understanding of other exercises from across the syllabus. The secondary exercises might be dealt with in the following ways:

- As an initial teaching exercise whereby the instructor breaks down a manoeuvre or procedure into a series of basic skills, each taught to and then practised by the student, resulting in the student being able to repeat the entire manoeuvre without assistance;
- As a fault finding exercise where the student pilot performs a manoeuvre with errors and the instructor is required to analyse the manoeuvre, identify the error(s) and re-teach the student how to fly the manoeuvre correctly.
- As a pattered exercise whereby the instructor demonstrates a manoeuvre or procedure whilst highlighting any salient points and offering guidance on technique, with the student following through on the controls or observing;
- As a pure demonstration of skill, without comment or instruction.

7.2 Prior to walking to the aeroplane, the examiner should ensure that any additional equipment that might be needed during the flight is available e.g. protractor for airborne navigation planning, view limiting devices for exercises involving simulated instrument flight or instrument covers for exercises simulating instrument failure.

7.3 The examiner will indicate the extent to which the inspection and completion of the aeroplane documents and pre-flight inspection of the aeroplane should be conducted as a demonstration of skill and knowledge or as a teaching exercise.

7.4 The departure may either be flown by the instructor or, where appropriate for the syllabus exercise, by the examiner acting as a student. In either case, the instructor should take the opportunity to build on the student's knowledge, skill, orientation, lookout and general airmanship.

7.5 The first part of the flight will concentrate on the applicant's ability to teach the flight exercise as briefed. Once established in a suitable training area the instructor should commence the primary lesson and continue to completion. The examiner will act according to the instruction given and simulate the responses and actions of a typical student. Occasionally he will make errors, particularly if the instruction received is not clear or if incorrect techniques are being taught. It is important that the examiner is consistent so that the instructor has a reasonable chance of recognising that a skill has been mastered or to identify errors and correct them. Once an error has been identified and corrected by the instructor, the examiner should refrain from making the same error again.

7.6 In order to condense the flight and enable all items to be assessed in a reasonable time, the

examiner may occasionally elect not to complete the briefed exercise when handed control. This is normally accomplished by taking control from the instructor and stating, "I have just completed that exercise to your satisfaction." When doing this, examiners must be careful not to rush the instructor or disrupt the flow or development of the lesson. Instructors are not expected to abbreviate any lessons.

7.7 After completion of the main exercise, the examiner will specify in turn the secondary exercises and indicate whether they are to be taught, pattered or demonstrated. The instructor will be given a few moments to consider how best to deliver each secondary exercise.

7.8 Previously the CAA required that examiners include a number of mandatory exercises in all instructor tests and checks. These are listed in Section 4 of Issue 3 Proof 2 of the Examiner's Report form SRG 1169 and include: Spin avoidance, safety module, take-off and climb; engine failure after take-off, approach, landing, missed approach and forced landing without power. The safety module included topics such as: flight in poor visibility and/or towards worsening weather, controlled flight into terrain, performance planning etc, These items were included for historical reasons as areas requiring special emphasis training and were chosen as a result of Mandatory Occurrence Report investigations, the work of the Air Accident Investigation Branch and as indicated by the Chief Flight Examiner at the annual FIE conference. For compliance with Part-FCL, the inclusion of such items as "mandatory" is no longer appropriate. Nevertheless, when considering which additional exercises to include in accordance with AMC 1 FCL.935 (e) the examiner is strongly recommended to consider including one or more of these items of special emphasis training as additional airborne exercises. Assessment of such exercises should be included in the overall assessment of airborne instructional competence in Section 3 of the Part-FCL AoC schedule and also as discussion items in Section 1 of the schedule.

7.9 If the assessment requires advanced manoeuvres such as spinning and aerobatics, but the weather or aircraft performance/limitations prevent such exercises from being completed, it may be necessary to assess these on a separate flight.

7.10 It is expected that the applicant will operate the aircraft at all times in a safe manner and using the correct techniques. In order to produce convincing and consistent demonstrations the applicant's handling skills and flying accuracy should be to a high standard. Therefore, the CPL Skill Test tolerances for height, heading and speed control as defined in Appendix 4 to Part-FCL shall apply.

7.11 Whilst it is expected that the applicant shall have a sound understanding of the content and development of the flight exercises, occasional and judicious reference to notes is permissible. However, it should be noted that this should not be to the detriment of the smooth flow of the lesson or safety of the flight.

7.12 **Spinning:** For the initial issue of an FI certificate the CAA requires that a full spin is included at some stage during the assessment of competence. This may be on the same flight or on a separate flight.

7.13 Spinning may be conducted either as the primary air exercise or as one of the secondary exercises. If flown as one of the secondary exercises, applicants and examiners are reminded that it should still be conducted as a teaching exercise; it is not sufficient for the applicant simply to demonstrate entry to and recovery from a spin. Therefore, an element of instruction must be given which should include some or all of the following:

(a) Precautions to be taken prior to deliberately spinning an aircraft

(b) Spin entry technique

(c) Signs of autorotation and an incipient spin

(d) Symptoms of a developed spin

(e) Spin recovery techniques at the incipient and developed stage

(f) Post spinning checks

7.14 It is recognised that the vagaries of UK weather and limited access to spin-able aeroplanes can result in delays or cancelled flight tests when spinning is a required item. As a concession, the UK CAA permits the spinning element of the FI AoC to be flown by the applicant and assessed by an examiner prior to the overall completion of the FI course. Applicants and examiners are reminded that this is still an assessment of competence for the grant of an instructor certificate. Therefore, the flight must be conducted under test conditions. Where the spinning item is conducted prior to completion of the FI course, the FIE must complete an Examiner's Report Form (SRG 1169) indicating satisfactory completion of the spinning item in Section 3. The flight should be recorded in the applicant's logbook and annotated by the FIE. These documents must then be presented to the FIE who conducts the remainder of FI AoC upon completion of the course. This flight is not to be included with the FI course hours.

7.15 For FIC and FIE initial certification, a full spin should be included as an exercise in how to teach and/or assess spinning safely.

7.16 Spinning is not a requirement for AoC for the revalidation or renewal of FI certificates or for CRI and IRI certificates, but it would be appropriate to include spinning for an FI or CRI who intends to use the privileges of the certificate to instruct for the aerobatic rating.

7.17 The following will be assessed throughout the flight by the examiner:

(a) Arrangement of demonstration

(b) Synchronising of speech/demonstration

(c) Correction of Faults

(d) Aircraft handling and flying accuracy

(e) Instructional technique

(f) General airmanship/safety/positioning and use of airspace

(g) The practical application of TEM and resource management

Debrief

7.18 After the flight the instructor will be required to debrief the examiner as a student. Generally this is based on the student's performance during the primary flight exercise. This is an important section and it is vital that it is not omitted or glossed over. It often provides a revealing insight into the instructor's perception of the flight, his knowledge and understanding of standard procedures and techniques and his assessment of the "student's" performance. Additionally, the points raised by the instructor will often answer some of the questions that the examiner may have intended to ask, or confirm the applicant's ability to detect student faults.

8. The Theoretical Knowledge Oral

8.1 The purpose of the theoretical knowledge oral examination is to determine the instructor's breadth and depth of knowledge, the ability to discuss with confidence questions related to aviation and to impart such knowledge and understanding to student pilots. Additionally, examiners should use the opportunity to discuss safety and information notices, circulars and standardisation material that has been notified through examiner and instructor refresher

seminars or meetings. In particular, topics relating to Flight Safety training should always be included.

8.2 Generally the oral examination of associated ground subjects for an instructor certificate takes between 1½ and 2 hours. The exact duration will depend on the nature of the assessment and the applicant's performance. The oral for class rating and instrument rating instructors should focus on those subject areas that are relevant to the privileges of the certificate.

The oral will cover the following subject areas:

(a) Air Law

(b) Aircraft General Knowledge

(c) Flight Performance and Planning

(d) Human performance

(e) Meteorology

(f) Navigation

(g) Operational Procedures

(h) Principles of Flight

(i) Training Administration

8.3 Before starting the ground oral, the applicant should be reminded that some questions may require an in-depth explanation; some may require reference to documents or training aids and others might be answered with a simple statement of fact. Questions relating to air law, regulatory requirements and training administration are generally posed to ensure that the applicant can locate the correct answer or required information from the appropriate source documentation. There should be no trick questions. If the applicant does not understand the question or does not know the answer, then he should either seek clarification or say so.

8.4 A theoretical knowledge question bank is provided as a supplement to this Standards Document. It is strongly recommended that all applicants refer to this supplement when preparing for the theoretical knowledge oral.

The following documents and equipment should be accessible to the applicant (documents may be made available in electronic format):

(a) UK Aeronautical Information Publication;

(b) Aeronautical Information Circulars;

(c) CAP 393 Air Navigation: The Order and Regulations;

(d) CAP 413 Radio Telephony Manual;

(e) EASA Part-FCL, Part-ORA and Part-ARA and the associated AMC and GM;

(f) CAP 804 Flight Crew Licensing: Mandatory Requirements, Policy and Guidance

(g) Aeronautical Charts;

(h) Training Syllabus;

(i) Aircraft Flight Manual or Pilot's Operating Handbook and checklist;

(j) The ATO Operations Manual;

(k) Training aids including aeroplane models, sectioned flight instruments etc;

(l) Training reference books, diagrams and notes as applicable to the syllabus;

(m) This Standards Document and other CAA Standards and Guidance Documents as appropriate to the syllabus.

The examiner should keep notes during the oral to facilitate debriefing.

8.5 Where an instructor holds both SE and ME instructional privileges and is revalidating the privileges of the instructor certificate in a SE aeroplane, the oral must include questions relevant to ME operations and instruction. Likewise, where the revalidation is being conducted in a ME aeroplane, the oral must include questions relevant to SE operations and instruction.

9. The Lecture or Long Briefing

9.1 The instructor will be expected to give a long briefing or short lecture lasting approximately 30 to 40 minutes.

9.2 The subject will be determined by the examiner and should be made known to the instructor not less than 2 days before the date of the assessment. Subject matter should be relevant and related to the appropriate instructional privileges and pilot training syllabus. Examiners should vary the subject matter so that it becomes a useful and challenging exercise for the instructor to research and prepare the lesson and not just repeat something that has been prepared and delivered as part of the course.

9.3 Instructors should expect to give the long briefing or lecture to a small audience comprising the examiner and other student pilots or instructors. Instructors will be expected to demonstrate effective use of a variety of training aids and equipment. Therefore, prior preparation and practise with such equipment is essential.

9.4 Some time should be allowed for at the end of the briefing or lecture for a reasonable number of questions from the audience. The examiner must ensure however, that this does not become a lengthy session or that the instructor is exposed to unreasonable questioning.

10. Assessment and Debriefing

10.1 The examiner shall consider all aspects of the assessment and the overall performance as well as individual items and sections. In principle, failure in any exercise during an assessment of competence requires a retest covering all exercises. Examiners may be pragmatic however and (in accordance with AMC5 FCL.935) assess the theoretical knowledge oral and long briefing/lecture (Section 1) separately from the flight instructional part of the AoC (pre-flight briefing, airborne exercises and post-flight debriefing).

A Pass will be achieved when all items and all sections are assessed as satisfactory.

10.2 A failure of Section 1 only (theoretical knowledge oral and long briefing) will be considered a Partial Pass and will require a re-assessment of Section 1. A failure of one or more of the flight instructional sections (the pre-flight brief, airborne exercises and post-flight debrief) will be considered a Partial Pass will require a re-assessment of all flight instructional sections. Failure of both Section 1 and one or more of the flight instructional sections will require a complete re-assessment.

10.3 Normally the applicant should be debriefed when all sections of the assessment have been completed. However, the examiner may terminate the assessment at any stage if it is considered that the applicant's demonstration of knowledge, flying or instructional skills is unsatisfactory and will require further training and re-assessment.

10.4 The preferred method for conducting the debriefing is for the examiner to state the overall result of the assessment at the beginning of the debrief. If the assessment results in a Partial Pass or Fail, the examiner must explain which section or sections were unsuccessful, the reasons for failure and any remedial action required, before moving on to any more general debrief topics.

10.5 The applicant should be encouraged to discuss the reasons for any failure but not to assess or criticise their own performance. Examiners should ensure that no misunderstandings

remain at the end of the debriefing and applicants should be given advice and guidance as necessary in order to improve their instructional competence.

10.6 Further training may be recommended following a Partial Pass or Fail; applicants are strongly advised to comply with any recommended retraining. Should an applicant fail an instructor assessment of competence on two consecutive occasions, the examiner should inform Flight Crew Standards. A CAA staff examiner may be allocated for any subsequent attempts.

11. Administration for the Issue of an Instructor Certificate

11.1 The examiner shall complete Instructor Form 1 (SRG 1131). This form should be forwarded to the CAA as soon as possible. A separate Examiner Report Form (SRG 1169) must also be completed and forwarded to the CAA by the Examiner. All signatures on the forms must be original, not photocopied.

The Examiner's record, Form SRG 1169 comprises the test or check schedule; when completed it forms a permanent record of the appropriate test or check. Examiners are required under FCL.1030 to keep a record of their tests and checks, subject also to data protection law, for 5 years; thereafter the form(s) are to be destroyed. The CAA may ask for access to these records at any time.

11.2 Applicants for the initial issue of an instructor certificate may not exercise the privileges of the certificate until it has been issued by the CAA. Examiners are not to make any entry in the applicant's licence.

12. Revalidation and Renewal of Instructor Certificates

12.1 FI revalidation and renewal requirements are at Part-FCL.940.FI and CAP 804 section H.

12.2 For revalidation of the FI(A) certificate, the holder shall fulfil 2 of the following 3 requirements:

(i) Complete at least 50 hours of flight instruction in the appropriate aircraft category during the period if validity of the certificate as FI, TRI, CRI, IRI, MI, or examiner. If the privileges to instruct for the IR are to be revalidated, 10 of these hours shall be flight instruction for an IR and shall have been completed within the last 12 months preceding the expiry date of the FI certificate;

(ii) Attend an instructor refresher seminar, within the period of validity of the instructor certificate;

(iii) Pass an assessment of competence in accordance with FCL.935, within the 12 months preceding the expiry date of the FI certificate.

Notes: Where an FI is qualified to:

- Instruct for the issue of an IMC rating (IR(R)) but NOT for an IR, the requirement for 10 hours IR/IMC training does not apply.
- Conduct IR training but does not meet the 10 hours IR training requirement, an AoC must be completed as one of the revalidation requirements with particular emphasis on applied instrument flight, in order to retain the privilege to instruct for the IR. A suitable IFR equipped aeroplane would be required in this case.

12.3 For at least each alternate subsequent revalidation, the holder shall have to pass an assessment of competence in accordance with FCL.935.

12.4 If the FI certificate has lapsed, the applicant shall, within a period of 12 months before renewal:

(i) attend an instructor refresher seminar;

(ii) pass an assessment of competence in accordance with Part-FCL.

13. The Class Rating Instructor (single-engine)

13.1 Applicants for a CRI certificate limited to single-engine aeroplanes shall have completed at least:

(i) 300 hours flight time as a pilot on aeroplanes;

(ii) 30 hours as PIC on the applicable class or type of aeroplane.

13.2 The training course is fully described at FCL.930.CRI and CAP 804 Section H and the revalidation and renewal requirements at FCL.940.CRI.

13.3 The assessment of competence will follow the same format as that for the FI(A) with the content appropriate to the privileges of the CRI.

13.4 The privileges of a CRI (single engine) are at FCL.905.CRI and also in CAP 804 Section H and are restricted to issue, revalidation and renewal of a class or type rating for non-complex non-high performance single-pilot aeroplanes, when the privileges sought by the applicant are to fly in single-pilot operations. Training for the issue of a towing or aerobatic rating may be included provided the CRI holds such ratings and has demonstrated the ability to instruct for that rating to an FI(A) qualified in accordance with FCL.905.FI(i). The privileges are further restricted to the class or type of aeroplane in which the instructor assessment of competence was taken. Extension to further classes or types is covered in the references.

14. The Class Rating Instructor (multi-engine) and addition of ME instructional privileges to the FI

14.1 Applicants for the issue of a CRI certificate for multi-engine aeroplanes shall have completed at least:

(i) 500 hours flight time as pilot on aeroplanes;

(ii) 30 hours as PIC on the applicable type or class of aeroplane.

14.2 See para. 13.2 above for reference to the training course and revalidation and renewal requirements.

14.3 The assessment of competence will follow the same format as that for the FI(A) with the content appropriate to the privileges of the ME CRI.

14.4 An FI(A) who wishes to instruct for the issue, revalidation or renewal of multi-engine class or type ratings, except for single-pilot high performance complex aeroplanes, must also meet the prerequisites for the CRI course at FCL.915.CRI (a) and the requirements of FCL.930.CRI and FCL.935. but will be fully credited towards the requirement of FCL.930.CRI (a)(1) – teaching and learning instruction.

15. The Instrument Rating Instructor and addition of instrument instruction privileges to the FI

15.1 Applicants for an IRI(A) certificate shall have completed at least 800 hours of flight time under IFR, of which at least 400 hours shall be in aeroplanes; and, in the case of applicants for an IRI(A) for ME (A), must also meet the requirements of FCL.915.CRI (a), i.e. 500 hours flight time as pilot of aeroplanes and 30 hours PIC on the applicable type or class.

15.2 The privileges of an IRI(A) are to instruct for the issue, revalidation and renewal of an IR(A) and EIR.

15.3 The course content is at FCL.930.IRI and includes 25 hours of teaching and learning, 10 hours of technical training and 10 hours of flight instruction in aeroplane, FFS or FNPTII.

15.4 An FI(A) may add instructional privileges for the IR in the appropriate aircraft category

provided the FI(A) has at least 200 hours of flight time under IFR, of which up to 50 hours may be instrument ground time in an FFS, FTD 2/3 or FNPTII. The FI(A) will be credited towards the requirements of FCL.930.IRI (a)(1) - the teaching and learning instruction, and have the flight instruction of (a)(3) reduced to 5 hours.

15.5 The assessment of competence will follow the same format as that for the FI(A) with the content appropriate to the privileges of the IRI(A).

16. The Synthetic Training Instructor

16.1 An applicant for a STI(A) certificate shall:

(a) hold, or have held within the three years prior to the application, a pilot licence and instructional privileges appropriate to the courses on which instruction is intended;

(b) have completed in an FNPT the relevant proficiency check for the class or type rating, within a period of 12 months preceding tha application.

An applicant for a STI(A) wishing to instruct on BITDs only, shall complete the exercises appropriate for the issue of a PPL(A).

16.2 The privileges of an STI(A) are to carry out synthetic flight instruction for:

(a) the issue of an aeroplane licence;

(b) the issue, revalidation or renewal of an IR(A) and a type or class rating for single-pilot aeroplanes, except for single-pilot high performance complex aeroplanes.

Additionally an STI(A) may give synthetic flight instruction during the core skills training of the MPL integrated training course.

16.3 Restricted privileges. The privileges of a STI(A) shall be restricted to the FNPTII/III, FTD 2/3 or FFS in which the training course was taken. These privileges may be extended to other FSTDs subject to terms in FCL.910.STI and CAP 804 Section H.

16.4 The STI(A) training course is detailed at FCL.930.STI; the 3 hours of flight instruction must be conducted under the supervision of an FIE(A)and may include the assessment of competence required by FCL.920.

17. The Flight Instructor Course Instructor (FIC) (FCL.905.FI (i))

17.1 In order to instruct for the FI(A) an unrestricted FI(A) must have completed 500 hours of flight instruction on aeroplanes.

17.2 An assessment of competence, in accordance with FCL.935, must be passed to demonstrate to a Flight Instructor Examiner (FIE(A)) the ability to instruct for the FI(A) certificate. The test content will include individual FI skills as well as the ability to instruct an FI(A) student 'how to teach' exercises specified by the FIE. The standard expected is high and applicants are strongly advised to undertake the recommended FIC Preparatory Course detailed at Appendix 2 before applying for the assessment of competence.

17.3 Normally the assessment of competence will be conducted by a CAA Staff FE or an FIE specifically appointed by the Authority. Application for the allocation of an examiner for the assessment of competence must be made to CAA Flight Crew Standards via email to flighttestbookings@caa.co.uk

APPENDIX 1

Assessment Criteria – General

1. Criteria for the assessment of instructor competence are provided in the following documents:
   - PANS Training (Chapter 4 and the attachment)
   - EASA Part FCL Subpart J and the associated GM and AMC
   - CAA Standards Document 29
   - CAA CAP737, Crew Resource Management Training

2. These criteria comprise a unit of competence, an element or elements of observable performance and the associated demonstration of knowledge. Although there are slight variations between the various documents, generally the main competence units are as follows:
   - Prepare resources;
   - Create a climate conducive to learning;
   - Present knowledge;
   - Integrate threat & error management and crew resource management;
   - Manage time to achieve training objectives;
   - Facilitate learning;
   - Assess trainee performance;
   - Monitor and review progress;
   - Evaluate training sessions;
   - Report outcome.

3. The assessment criteria presented in this appendix are compatible with and expand upon the general competence units listed above by providing a list of representative behavioural markers. For convenience, the order in which the behavioural markers are presented reflects more the order of events of a typical instructor AoC rather than the order in which the competence units are listed in the source documents. They are presented as word pictures that describe acceptable performance and are provided to facilitate the objective, reliable and transparent assessment of instructor competence by examiners. The aim is to ensure that all instructors, and those who train instructors, have access to and understand the criteria against which their performance is assessed, enabling them to be appropriately trained and fully prepared.

Assessment Criteria – Pre-Flight Briefing

4. The purpose of the pre-flight briefing is to ensure that the student is prepared for the airborne instruction he/she is about to receive. This should not be the time to introduce new concepts to the student – all the theory underpinning the practical lesson should have been learnt previously from a long briefing and by directed self-study. The pre-flight briefing should take approximately 20 minutes and ideally be given shortly before the airborne lesson, so that it is fresh in the student's mind.

5. The schedule for the instructor assessment of competence (AMC3 FCL.935 and SRG Form 1169) lists the following items for assessment:
   (a) Visual presentation and content;
   (b) Technical accuracy;

(c) Clarity of explanation;

(d) Clarity of speech;

(e) Instructional technique;

(f) Use of model and aids;

(g) Student participation.

6. Generally, examiners look at pre-flight briefing as a whole and assess it in three main areas: overall presentation, instructional technique and technical content. The following bullet points are indicators of sound instructor competence:

Overall presentation:

(a) The brief is presented in a location conducive to learning, for example an enclosed briefing room or private area with low ambient noise level.

(b) The temperature and lighting are adjusted to make the environment comfortable.

(c) The instructor is fully prepared for the briefing and prepares the room and training aids before the arrival of the student.

(d) The instructor establishes his credentials and ascertains the trainee's requirements and stage of training.

(e) The instructor utilises training aids and tools in an appropriate and effective manner to enhance the impact of verbal briefing.

(f) Where a whiteboard, flip sheet or OHP is used, the layout is logical and uncluttered, colour is used consistently and effectively (e.g. red to indicate importance or danger); handwriting and diagrams are neat and clear.

(g) Where an OHP or digital media is used, the instructor uses a "gradual reveal" technique to focus the student's attention on the part of the lesson being discussed.

(h) Where training aids such as model aircraft or sectioned instruments are used, the instructor indicates movement or operation in the correct sense and from the perspective of the student.

Instructional technique:

(a) The instructor's manner and attitude encourages a relaxed but effective and professional environment conducive to learning.

(b) The instructor recognises the trainee's needs, ability and any barriers to learning and adapts his/her teaching style accordingly.

(c) The instructor role models positive behavioural traits such as enthusiasm, patience, honesty, flexibility, self-confidence and where appropriate, humour.

(d) The instructor does not exhibit any distracting mannerisms or display any negative personality traits such as sarcasm, disinterest, impatience, arrogance, an overbearing or demeaning manner.

(e) The instructor uses appropriate question technique to establish the student's existing level of knowledge and personal preparation.

(f) Explanations given are communicated clearly, concisely and are technically correct and illustrated with appropriate use of visual aids.

(g) Throughout the brief the instructor makes it quite clear who will be in control of the aeroplane by using phrases such as, "I will teach.....,You will practise...., " rather than the less specific, "We will have a look at...."

(h) The student is encouraged to participate fully in the brief and the instructor regularly checks understanding by posing appropriate and relevant questions.

Technical content:

(a) The instructor is familiar with the briefed material and demonstrates adequate knowledge for the role.

(b) The brief includes a relevant and achievable aim and clearly defined objectives.

(c) The instructor builds upon previous lessons and indicates, in a logical sequence, how the lesson will progress; which skills will be revised from previous lessons, which new skills will be learnt and how the aim will be achieved.

(d) It is assumed that the lesson is part of a structured syllabus, in which case the instructor briefs all items within the syllabus lesson plan without omission.

(e) Where the instructor refers to specifics, for example engine and airframe limitations, operating speeds, power settings etc, these are technically correct.

(f) In addition to briefing the main exercise, the instructor incorporates practical guidance and training in airmanship, resource management and threat and error management, and indicates to the student why this is relevant and how it will be achieved.

(g) The instructor is able to provide clear, concise and technically correct answers to student questions or concerns related to but not necessarily part of the briefed exercise.

Assessment Criteria – Airborne Exercises

7. For the airborne exercise instructors will be assessed on their personal flying ability, flight management skills and ability to present a coherent and effective instructional lesson.

8. The flight lesson begins with pre-flight preparation. All instructors must be able to determine, without error, that they, their students and the aircraft they are about to fly are suitable prepared for flight. Pre-flight preparation includes (but is not limited to) the following items:

(a) Personal preparation, for example by using the “I’M SAFE” (Illness, Medication, Stress, Alcohol, Fatigue, Eating) mnemonic.

(b) Aircraft performance planning. The instructor calculates the aircraft performance for the prevailing conditions and ascertains that the take off and landing distances available, after considering any additional factors, are sufficient for the flight to be conducted safely.

(c) Mass and Balance. The instructor calculates the aircraft mass and balance and confirms that it will remain within limits throughout the flight.

(d) Pilot Operating Handbook or Aircraft Flight Manual and Checklist. The instructor is thoroughly familiar with the POH/AFM & Checklist and is able to obtain information regarding the aircraft specifications, limitations, normal and abnormal operation, performance, loading, handling and systems without error.

(e) Fuel planning. The instructor completes a fuel plan and confirms that the fuel has been checked to ensure that the intended flight may be conducted safely and completed with sufficient reserve and contingency fuel.

(f) NOTAM and Weather Data. The instructor checks and correctly interprets NOTAM and weather information and ensures that the intended flight can be conducted safely and effectively with a high likelihood of achieving the aim.

(g) Use of AIP and AIC. The instructor has a working familiarity with the relevant parts of the AIP and associated AIC and is able to obtain information relevant to the airfields, airspace and aeronautical facilities likely to be used on the intended flight.

9. Although instructors must complete thorough pre-flight planning and preparation for all flights, for the sake of expediency examiners may select only one or two items to formally assess. This may be conducted either as a teaching exercise or as a demonstration.

10. For the main airborne exercise, and any additional exercises, the AoC schedule lists the following items for assessment:

(a) Arrangement of demonstration;

(b) Synchronisation of speech/demo;

(c) Correction of faults;

(d) Aeroplane handling;

(e) Instructional technique;

(f) General airmanship/Safety;

(g) Position and use of airspace.

11. As with the pre-flight brief, the examiner generally looks at the overall picture to assess whether the instructor gives an effective lesson and demonstrates satisfactory standards of aircraft handling and flight management. The following are reliable indicators of competence for an airborne instructional lesson:

(a) The instructor selects an appropriate operating area and altitude band in which to present the exercise. For example, for early training exercises an area with a distinct horizon and minimal turbulence and an altitude that ensures satisfactory aircraft performance.

(b) The instructor ensures that the student is comfortable and that communication is unhindered (radio and intercom volume and squelch are correctly set). Where possible, a "quiet" frequency is selected so that the lesson is not interrupted with background radio chatter.

(c) The instructor uses clear, concise and unambiguous phrases with correct and appropriate aviation phraseology.

(d) Hand-over and take-over protocol is exemplary. There is never any doubt about who has control of the aircraft.

(e) The instructor refrains from making control inputs (riding the controls) when the student is flying. If corrective action is necessary the instructor takes control from the student.

(f) When skills involving control inputs are being taught, the student is invited to "follow through" whilst the instructor manipulates the controls. Upon completion of the demonstration the student is instructed to "relax".

(g) The instructor briefs the student on the exercise to be flown, hands over control, then monitors in silence as the student practises the manoeuvre. Upon completion of the practise, the instructor takes back control before debriefing/re-briefing. Note: This is in contrast to the instructor handing over control ***then*** giving the brief, or debriefing whilst the student is still in control of the aeroplane. The latter is poor instructional technique because the student must concentrate both on controlling the aircraft and listening to the instructor.

(h) Generally, it is poor practise to coach a student through a manoeuvre. Occasional words of encouragement are perfectly acceptable such as, "Good", "That's nice", "Well done" etc. However, the instructor should avoid providing further guidance, for example: "Add more power", "Raise the nose 5 degrees", "Select approach flap now" etc. An instructor who tends to do this should ask him/her self the question, "How will my student perform when I'm not here?"

(i) When the instructor is flying he/she keeps the student mentally alert and engaged in the conduct of the flight, for example by asking for routine cruise checks or an assessment of position in relationship to the airfield.

(j) The instructor highlights where skills or procedures involve the practical application of previously acquired theoretical knowledge.

(k) The student is never put in a position where he/she is attempting a manoeuvre or trying to emulate skills that have not previously been taught.

(l) Once a manoeuvre or skill has been taught, the student is given every opportunity to

practise that manoeuvre or skill, for example by configuring the aircraft for the next event.

(m) The instructor always adopts the same techniques as those taught and expected of the student. For example, if students are taught and expected to perform a thorough lookout prior to commencing each manoeuvre (which they should be), then the instructor must set an exemplary example by doing likewise. It is all too easy to give the impression that there are two ways of flying, one when learning and another when qualified and experienced.

(n) All demonstrations are convincing and accurately flown with smooth, co-ordinated control inputs. When quoting speed, altitude, heading, power settings and other parameters the instructor ensures that they correspond with the actual aircraft performance and configuration.

(o) The instructor does not attempt to gloss over or bluster his/her way out of poor demonstrations. The instructor admits the error and repeats the demonstration, where appropriate making a teaching point out of it.

(p) Where appropriate, the instructor introduces “deliberate errors”. For example, when first teaching how to regain level flight the instructor deliberately selects an attitude that is slightly too high or too low. He/she then indicates that the attitude selected is incorrect because the altimeter indicates a gradual climb/descent and shows how an adjustment is necessary to refine level flight.

(q) The instructor’s “patter” is co-ordinated with the demonstration such that the aircraft can be seen to be responding in the manner described.

(r) The lesson is developed in the same sequence and with the same content as the pre-flight brief.

(s) The instructor is attuned to the student’s ability and progress and adjusts the pace of the lesson accordingly.

(t) The instructor maintains a high level of situational awareness and uses the airspace efficiently such that the lesson is not prolonged unnecessarily with re-positioning.

(u) The instructor continues to prosecute an effective lookout throughout the lesson and avoids becoming engrossed in events within the aircraft.

(v) The instructor recognises and corrects significant student-handling errors in a sympathetic and efficient manner and at the earliest appropriate moment.

(w) The instructor is not overly fussy about minor student handling errors to the detriment to the flow and continuity of the airborne exercise.

(x) The instructor encourages critical self-analysis.

(y) The instructor provides appropriate positive comment and praise to reinforce correct technique, effective flight management and sound decision-making by the student.

(z) The instructor incorporates or highlights practical examples of “airmanship”, threat avoidance, resource management, aeronautical decision-making and error management into the air exercise.

Assessment Criteria – Post Flight Debriefing

12. The post-flight debriefing is an often overlooked but vital part of pilot training. It provides an opportunity for the student to consolidate his/her thoughts whilst the preceding lesson is still fresh in the mind and for the instructor to reinforce important teaching points and clear up any misunderstandings. Additionally, the instructor can focus attention and direct any self-study for the next lesson or part of the syllabus.

13. The following are indicators of competent debriefing skills:

(a) The instructor correctly identifies and states whether or not the student achieved the aim of the lesson.

(b) The instructor correctly identifies any critical handling errors and/or fundamental gaps in the student's knowledge, skills and understanding and specifies appropriate remedial training.

(c) The instructor correctly identifies any minor handling errors and/or any minor gaps in the student's knowledge, skills and understanding and corrects these by de-briefing and directed self study.

(d) The instructor correctly identifies and praises examples of student progress and achievement and developing competence, and skill.

(e) The instructor reinforces examples of sound decision-making and effective threat and error management and resource management.

(f) Where appropriate, the instructor makes reference to a suitable behavioural marker system (e.g. NOTECH) to reinforce the debriefing of non-technical skills.

(g) The debrief focuses on significant aspects of the lesson, rather than simply following a chronological order of events.

(h) The instructor encourages student participation, self analysis and where appropriate self critique and uses facilitative techniques to check comprehension and enhance the learning process.

(i) The instructor provides clear, concise and technically correct answers in response to direct student questions.

(j) The instructor provides directed self-study in anticipation of the next lesson or part of the syllabus.

(k) The instructor completes the student's training record with clear, concise notes and objective assessment.

(l) Inadequate student progress or critical errors and omissions are recorded and highlighted for attention and remedial action.

Assessment Criteria – Theoretical Knowledge Oral and Long Briefing/Lecture

14. As for the pre-flight briefing, examiners generally look at the theoretical knowledge oral and long briefing as a whole and assess three main areas: overall presentation, instructional technique and technical content. Many of the indicators of instructor competence are the same as those listed for the pre-flight briefing and post-flight debriefing at paragraphs 5-7 and 13, above. The following additional criteria apply:

(a) The instructor is able to locate and indicate the content of the relevant theoretical knowledge syllabus.

(b) The instructor retains a working knowledge and understanding of the majority of topics from the relevant theoretical knowledge syllabus and is able to discuss with confidence and answer questions related to the syllabus (theoretical knowledge oral).

(c) With sufficient time to prepare, the instructor demonstrates the ability to teach in depth and from basic principles any topic from within the appropriate theoretical knowledge syllabus (long briefing).

(d) Where the instructor makes a statement or provides information, either during a prepared brief or when answering questions, the information is technically correct.

(e) The instructor is able to indicate where relevant information may be found in source documents, reference material and training manuals.

APPENDIX 2

FIC Instructor Preparatory Course

Objectives
Although not a mandatory requirement, a course of tuition is strongly recommended to give the FI adequate training in the instructor training techniques required when conducting the Flight Instructor, Class Rating Instructor or Instrument Rating Instructor Course (FIC instructor). On completion of the course, the course tutor will be well placed to advise whether or not the applicant should proceed to the AoC for the addition of FIC privileges to an FI certificate in accordance with FCL.905.FI (i).

The tutor should also be able to advise the FI of his/her strengths and weaknesses, suggesting any further training or experience that may be required prior to the AoC, for example:

- Gain more experience in the field;
- Further self study;
- Observation of one or more FI training courses;
- Undertake further training.

The FIC preparatory course is not an approved course and is not considered as a pass or fail course; the purpose is to prepare suitably experienced and able applicants for a future role as instructor trainers.

The Course
The course should stress the standardisation of teaching methods.

The applicant FI should already be fully familiar with the PPL syllabus, lesson plans and theoretical knowledge underpinning the lessons, thus the main thrust of the course is to enhance one's ability to "TEACH THE TEACHER".

The applicant will be expected not just to present example air exercises as if to a student pilot, but also provide advice and guidance on instructional technique to the would-be instructor. This requires a thorough understanding of the structure and content of the overall syllabus and every lesson within the syllabus, including knowing why particular lessons are taught in such a fashion or sequence. The applicant must also be able to give insight into typical student errors, strengths and weaknesses.

Course Schedule
The course tutor should contact the applicant well in advance to establish the course requirements. The course will vary in length and content according to the qualifications and experience of the applicant. The course should be designed to cover aspects of each qualification held for example, PPL, Night, Applied IF, ME class rating and aerobatics. The course schedule should be planned well in advance and a copy sent to the applicant. An example course is attached below.

FIC Instructor's Preparatory Course

Schedule of Sample Course

DAY ONE

0900 – 0930	Course Outline and Aim
0930 – 1000	FIC Course Documentation and Instructor Privileges
1000 – 1100	Philosophy of Teaching
1100 – 1230	The Lesson Structure: • Ground Preparation • The Structure of the Air Exercise • The "Give" and "Giveback"

	• The Debrief
1230 – 1330	Lunch
1330 – 1400	Performance and Type Techniques - AFM/POH and Engine Manual
1400 – 1500	Discussion of Training
1500 - 1530	Tea
1530 – 1700	Discussion of ANO, AIC, EASA Part-FCL, Part-ORA, AIP, CAP 804
DAY 2	
0900 – 1100	Navigation Techniques and MDR - Discussion
1100 – 1200	Spinning and Stalling - Discussion
1200 – 1300	Lunch
1300 – 1500	Air Exercise and Briefs – (Descending 2 Exercise 8)
1500 – 1530	Tea
1530 – 1700	Air Exercise and Briefs – (Forced Landings with and without power Ex 16 and 17)
DAY 3	
0900 – 1000	Discussion of Circuit Techniques • Normal Power Approach – Performance • Go Around • Glide Approach and Landing • Crosswind Landing • Flapless Landing • Bad weather circuit and Short field
1000 – 1200	Air Exercise and Briefs • Steep Turns Ex 15.1, 15.2 and 15.3.1 • Airfield Joining and Circuits Ex 13.1-3 and 12 • Normal Power Approach Ex 13.2 • Go Around Ex 13.3 • Glide Approach Ex 13.4 • Crosswind Approach and Landing Ex 13.6 • Flapless Approach and Landing Ex 13.7 • Performance Landing Ex 13.9
1200 - 1300	Lunch
1300 - 1400	Basic Instrument Technique Ex 19 1-5
1400 - 1500	Ex 19a.1-6 Discussion
1500 - 1530	Tea
1530 - 1700	Air Exercise and Briefs - Full Panel IF Ex 19a, Ex 19 b 1 and 2

Note: By the end of Day 3, the Course Tutor should be able to make an assessment of the applicant's

progress and suitability to the authorisation flight test.

Should the applicant be qualified to instruct Applied IF then it is recommended that the course continue to Day 4.

DAY 4

0900 - 0930	Discussion of Limited Panel techniques and recovery from Unusual Attitudes Ex 19b.1, 1-5, Ex 19b2. 1-5
0930 - 1000	Discussion of the Hold and Non-Precision Approach
1000 - 1200	Air Exercise and Briefs • Limited Panel, Ex 19b1-2 • Homing, Hold and Non-Precision approaches, GNSS/VOR/NDB, Ex 19d.1, 19d.3 and 19d.4
1200 - 1300	Lunch
1300 - 1600	Discussion of precision and ground controlled approach procedures, ILS, PAR & SRA teaching techniques, flight exercise and briefing - Instrument Approach, Ex 19d.4 • PAR/SRA • ILS
1600 - 1630	Tea
1630 - 1700	Discussion of Flight Planning and Log Keeping

APPENDIX 3

Associated Forms and Documents

- Form SRG 1131
- Form SRG 1133
- Form SRG 1135
- Form SRG 1169
- **Standards Documents 1, 3, 10, 14, 19**
- **Standards Document 55**

APPENDIX 4

Flight Exercises with Standard Exercise Numbering

Introduction

This Standard Exercise Numbering System should be used in all references to the flight exercises in syllabuses, student records, logbooks and instructor training records.

1 FAMILIARISATION WITH THE AEROPLANE

1.1 AEROPLANE GENERAL
1.1.1 External features
1.1.2 Internal features
1.1.3 The cockpit and controls
1.1.4 Introduction to Checklist

1.2 AIRCRAFT SYSTEMS, NORMAL AND ABNORMAL OPERATION
1.2.1 All systems, normal operation
1.2.2 Systems failures, abnormal operation and procedures
1.2.3 Re-starting the engine in flight, automatic starter and aerodynamic procedures

1.3 FIRE DRILLS
1.3.1 Engine fire on the ground
1.3.2 Engine fire in the air
1.3.3 Cabin fire
1.3.4 Electrical fire

1.4 EMERGENCY DRILLS
1.4.1 Location and use of emergency equipment
1.4.2 Emergency landing/ditching procedures
1.4.3 Location and operation of escape hatches
1.4.4 Evacuation, land/water
1.4.5 Emergency communications
1.4.6 Radio failure procedures (appropriate to stage of course)
(a) Local or FIR day
(b) Local or FIR night
(c) Controlled airspace

2 PREPARATION FOR FLIGHT AND ACTION AFTER FLIGHT

2.1 PRE AND POST FLIGHT PROCEDURES
2.1.1 Pre-departure procedures
2.1.2 Pre-flight inspection
2.1.3 Checks before starting
2.1.4 Starting procedure
2.1.5 Checks after starting
2.1.6 Radio and instrument checks
2.1.7 Power check
2.1.8 Arrival procedure

3 AIR EXPERIENCE

3.1 FAMILIARISATION FLIGHT
3.1.1 Seat, harness and control adjustment
3.1.2 Headset and intercom
3.1.3 Local flight

4 EFFECTS OF CONTROLS

4.1 THE FLYING CONTROLS
4.1.1 Primary effects
4.1.2 Secondary effects
4.1.3 The effects of airflow and power

4.2 THE TRIM, ENGINE AND ANCILLARY CONTROLS
4.2.1 The trim controls
4.2.2 The throttle and RPM control
4.2.3 The flaps
4.2.4 The landing gear
4.2.5 Other engine and ancillary controls

5 TAXYING

5.1 BASIC CONTROL TECHNIQUE, PRECAUTIONS AND TAXYING
5.1.1 Preliminary checks and lookout
5.1.2 Starting-off, control of speed and stopping
5.1.3 Control of direction and turning
5.1.4 The effects of wind
5.1.5 The effects of ground surfaces
5.1.6 Special precautions and abnormal procedures
5.1.7 Taxying checks
5.1.8 Emergencies (brakes and steering failure)

5.2 AIRFIELD PROCEDURES
5.2.1 Clearances and ATC liaison
5.2.2 Airfield discipline
5.2.3 Airfield charts for ground movements

6 STRAIGHT AND LEVEL

6.1 BASIC CONTROL TECHNIQUE
6.1.1 Visual attitude for straight and level flight
6.1.2 Demonstration of inherent stability
6.1.3 Use of controls
6.1.4 Regaining datum heading and altitude

6.2 PRECISION EXERCISES
6.2.1 Straight and level at various power settings
6.2.2 Straight and level at selected airspeeds
6.2.3 Straight and level when changing configuration

6.3 PERFORMANCE APPLICATIONS
6.3.1 Cruising for maximum range
6.3.2 Cruising for maximum endurance

7 CLIMBING

7.1 BASIC CONTROL TECHNIQUE
7.1.1 Climbing at recommended power and IAS
7.1.2 Climbing with flaps down

7.2 PERFORMANCE APPLICATIONS
7.2.1 Prolonged climb
7.2.2 Climbing at maximum rate
7.2.3 Climbing maximum angle
7.2.4 Cruise climb

8 DESCENDING

8.1 GLIDING
8.1.1 Entering and maintaining the glide
8.1.2 Levelling off
8.1.3 Precision exercise
8.2 DESCENDING AT SELECTED RATES OF DESCENT AND AIRSPEEDS
8.2.1 Descending with flap
8.2.2 Descending with power
8.2.3 Descending at selected rates of descent and airspeeds

8.3 PERFORMANCE APPLICATIONS
8.3.1 Gliding, clean
8.3.2 Gliding, approach configuration
8.3.3 Side slipping
8.3.4 En-route descent

8.4 EMERGENCY DESCENT
8.4.1 Glide at maximum flap speed (Vfe)
8.4.2 Descending at maximum permitted IAS (Vne)

9 MEDIUM TURNS

9.1 BASICCONTROLTECHNIQUE
9.1.1 Orientation and lookout
9.1.2 Level turns
9.1.3 Climbing turns
9.1.4 Descending turns
9.1.5 Gliding turns

9.2 PRECISION EXERCISES
9.2.1 Turns onto specified landmarks and headings
9.2.2 Turns in the approach and landing configuration
9.2.3 The relationship between IAS, bank and rate of turn

9.3 ABNORMAL (DI FAILURE) PROCEDURE
9.3.1 Compass errors
9.3.2 Compass/timed turns

10 SLOW FLIGHT AND STALLING

10A SLOW FLIGHT
10A.1 Controlled slow flight, clean configuration, at Vso+10 Kt. reducing to Vso+ 5Kt.(or above stall warning)
10A.1.1 Straight and level and level turns
10A.1.2 Climbing and descending with turns
10A.1.3 Descending unbalanced turns at low airspeed
10A.1.4 The effect of pilot distractions on safety

10A.2 Controlled slow flight, with flap, at Vs + 10 Kt. reducing to Vs +5 Kt. (or above stall warning)
10A.2.1 Straight and level turns
10A.2.2 Climbing and descending with turns
10A.2.3 The effect of going around in configurations where applications of engine power causes a strong nose-up trim change

10B STALLING
10B.1 Basic stalling

10B.1.1 Pre-stalling checks
10B.1.2 Approach to the stall
10B.1.3 Recovery from stalls when power is not available
10B.1.4 Full stall, clean configuration, power off, standard recovery
10B.1.5 Stall with wing drop and standard recovery
10B.1.6 Standard recovery at stall warning

10B.2 Advanced stalling
10B.2.1 Full stall, flaps down, power off and standard recovery
10B.2.2 Full stall, flaps down, approach power and standard recovery
10B.2.3 Full stall, landing configuration, approach power and standard recovery
10B.2.4 Approach to the stall warning in the landing configuration and standard recovery
10B.2.5 Full stall and stall warning recovery from a banked attitude
10B.2.6 Secondary stalls with increased wing loading
10B.2.7 Stall from maximum power climbs (straight and turning)

11 SPINNING

11A SPIN RECOVERY AT THE INCIPIENT STAGE
11A.1 Pre-spinning checks
11A.2 Symptoms of the incipient stage
11A.3 Recovery after a level flight entry
11A.4 Recovery after entry from other attitudes

11B SPIN RECOVERY AT THE DEVELOPED STAGE
11B.1 Pre-spinning checks
11B.2 Spin entry and recognition of spin direction
11B.3 Recovery after a level flight entry
11B.4 Recovery after entry from other attitudes
11B.5 Effect of power and flaps (if not restricted)

11C EMERGENCY RECOVERY

12 TAKE-OFF AND CLIMB

12.1 TAKE-OFF INTO WIND
12.1.1 Pre take-off and runway checks
12.1.2 Take-off and initial climb to circuit height
12.1.3 Climb to downwind
12.1.4 Take-off and circuit departure

12.2 ENGINE FAILURE AFTER TAKE-OFF
12.2.1 Take-off Safety Speed considerations
12.2.2 Control following engine failure on the ground
12.2.3 Control following engine failure after take-off
12.2.4 Emergency drills

12.3 TAKE OFF OUT OF WIND
12.3.1 Calculation of crosswind component
12.3.2 Take-off and initial climb

12.4 PERFORMANCE TAKE-OFF
12.4.1 Short take-off, scheduled technique to 50'
12.4.2 The effects of different types or contaminated surfaces on control and take-off distance

12.5 NOISE ABATEMENT PROCEDURES
12.5.1 Effect on take-off roll and climb performance; routings

13 APPROACH AND LANDING

13.1 AIRFIELD PROCEDURES
13.1.1 Airfield Approach Checks
13.1.2 Joining the circuit
13.1.3 Circuit pattern and Landing Checks

13.2 ENGINE ASSISTED APPROACH AND LANDING
13.2.1 The approach
13.2.2 Round out and landing
13.2.3 Control after landing
13.2.4 Touch and go landing

13.3 MISSED APPROACH/MISSED LANDING PROCEDURES
13.3.1 From a missed approach
13.3.2 From a missed landing

13.4 GLIDE APPROACH AND LANDING
13.4.1 The approach
13.4.2 Round out and landing

13.5 APPROACH AND LANDING (TAILWHEEL AEROPLANE)
13.5.1 The approach
13.5.2 Round out and landing
13.5.3 Control after landing

13.6 OUT OF WIND CIRCUIT AND LANDING
13.6.1 Calculation of crosswind component
13.6.2 Circuit adjustments
13.6.3 The approach
13.6.4 Round out and landing
13.6.5 Control after landing

13.7 FLAPLESS LANDING
13.7.1 Check of landing distance
13.7. adjustments
13.7.3 The approach
13.7.4 Round out and landing

13.8 LANDING ON AN ALTERNATIVE SURFACE, GRASS OR RUNWAY
13.8.1 The approach
13.8.2 Round out and landing
13.8.3 Control after landing

13.9 PERFORMANCE (MINIMUM LANDING DISTANCE) APPLICATION
13.9.1 The approach to 50'
13.9.2 Scheduled minimum field length technique from 50′
13.9.3 Control after landing
13.9.4 The effects of surface conditions on landing distance, control and braking techniques

14 FIRST SOLO

14.1 PRELIMINARY TRAINING
14.2 Flying ability final check
14.3 Timing a first solo
14.4 Briefing a first solo
14.5 Observing a first solo

15 ADVANCED TURNING

15.1 BASIC CONTROL TECHNIQUE
15.1.1 Orientation and lookout
15.1.2 Steep level turns
15.1.3 Correction of faults
15.1.4 Symptoms of the stall in the turn and recovery

15.2 PRECISION EXERCISES
15.2.1 Steep descending turns
15.2.2 Steep gliding turns
15.2.3 Steep climbing turns
15.2.4 Maximum rate turns

15.3 RELATED REVISION EXERCISES
15.3.1 Unusual attitudes (including spiral dives)
15.3.2 Spin recovery (from the turn)

16 FORCED LANDING WITHOUT POWER

16.1 Approach from 1000'
16.1.1 Glide approach and landing on the airfield
16.1.2 Glide approach to go-around over selected area

16.2 FULL FORCED LANDING PROCEDURE
16.2.1 Full procedure to go-around, including selection of field and all drills
16.2.2 Practice approaches from various heights and positions

17 PRECAUTIONARY LANDING

17.1 PROCEDURE
17.1.1 Landing area selection
17.1.2 Inspection of landing area
17.1.3 Circuit, approach and landing

18A PILOT NAVIGATION

18A.1 FLIGHT PLANNING
18A.1.1 Weather forecast and actuals
18A.1.2 Map selection and preparation
18A.1.3 Calculations (including MSA)
18A.1.4 Flight information
18A.1.5 Notification of the flight

18A.2 AERODROME DEPARTURE
18A.2.1 Cockpit management
18A.2.2 Departure procedure

18A.3 EN ROUTE
18A.3.1 Navigation technique and hazard avoidance
18A.3.2 Minimum weather conditions including navigation when VFR cannot be maintained
18A.3.3 Diversion procedure
18A.3.4 Operations in regulated/controlled airspace

18A.4 UNCERTAIN OF POSITION/LOST PROCEDURE
18A.4.1 Uncertain of position
18A.4.2 Lost procedure

18A.5 ARRIVAL PROCEDURE
18A.5.1 Aerodrome joining procedures
18A.5.2 Parking procedures

18B NAVIGATION AT LOWER LEVELS

18B.1 LOW LEVEL FAMILIARISATION
18B.1.1 Entry/exit lanes
18B.1.2 Actions before descending (MSA)
18B.1.3 Visual impressions and height keeping
18B.1.4 Effects of speed and inertia in turns
18B.1.5 Effects of wind and turbulence

18B.2 LOW LEVEL OPERATION/HAZARDS
18B.2.1 Minimum level navigation
18B.2.2 Bad weather operations
18B.2.3 Airfield approach and joining
18B.2.4 Bad weather circuit/landing

18C RADIO NAVIGATION UNDER VFR

18C.1 USE OF RADIO NAVIGATION AIDS
18C.1.1 VOR
18C.1.2 ADF
18C.1.3 VDF
18C.1.4 Radar (en-route/terminal)
18C.1.5 DME
18C.1.6 RNAV and GNSS

19A INSTRUMENT FLYING, BASIC, FULL PANEL

19A.1 BASIC CONTROL TECHNIQUE
19A.1.1 Pre-flight instrument checks, revision
19A.1.2 Disorientation
19A.1.3 Relaxation
19A.1.4 The control instruments, indications and interpretation
19A.1.5 The performance instruments, indications and interpretation
19A.1.6 Selective radial scanning
19A.1.7 Priority radial scanning
19A.1.8 Attitude flight, level, climbing, descending and turning
19A.1.9 Configuration changes
19A.1.10 Instrument errors

19A.2 PRECISION EXERCISES
19A.2.1 Level flight, climbing and descending with specified settings
19A.2.2 Level, climbing and descending turns at Rate 1 onto specified headings
19A.2.3 Level 30° banked turns onto specified headings
19A.2.4 Changing speed in level flight
19A.2.5 Changing configuration

19B INSTRUMENT FLYING, ABNORMAL (LIMITED PANEL) OPERATION

19B.1 BASIC CONTROL TECHNIQUE
19B.1.1 Attitude interpretation using the performance instruments
19B.1.2 Modified scanning technique
19B.1.3 Level flight, climbing and descending
19B.1.4 Compass/timed turns

19B.1.5 Changing speed and configuration

19B.2 UNUSUAL ATTITUDE RECOVERIES
19B.2.1 Recovery, sustained steep turns
19B.2.2 Recovery, approach to a stall
19B.2.3 Recovery, straight dives
19B.2.4 Recovery, spiral dives
19B.2.5 Recovery, steep climbing turns

19C INSTRUMENT FLYING, ADVANCED, FULL PANEL
19C.1 PRECISION EXERCISES, PRE-NIGHT FLYING REQUIREMENTS
19C.1.1 Instrument climb following a visual take-off
19C.1.2 Instrument circuit, approach and go-around, including checklist items

19C.2 ABNORMAL (ASYMMETRIC) OPERATION
19C.2.1 Asymmetric instrument flying, climbs, descents and turns including check-list items
19C.2.2 EFATO (after simulated take-off) and asymmetric climb including check-list items
19C.2.3 Asymmetric circuit, approach and go-around including check-list items

19D INSTRUMENT FLYING, APPLIED

19D.1 INSTRUMENT/NAVAID TRACKING
19D.1.1 Modified instrument scanning to include navigation aids
19D.1.2 Intercepting and maintaining ADF tracks, to/from
19D.1.3 Intercepting and maintaining VOR tracks, to/from

19D.2 ROUTE FLYING
19D.2.1 Take-off, climb and procedural departure
19D.2.2 Airways routes
19D.2.3 Off airways routes
19D.2.4 Combined airways and off airways routes

19D.3 HOLDING PROCEDURES
19D.3.1 En-route holding
19D.3.2 Terminal holding

19D.4 AIRFIELD/RUNWAY APPROACH/MISSED APPROACH PROCEDURES
19D.4.1 Procedural approach
19D.4.2 Radar vectored approach
19D.4.3 Missed approach procedure

19D.5 ABNORMAL (ASYMMETRIC) PROCEDURES
19D.5.1 Simulated engine failure following an actual take-off
19D.5.2 Asymmetric approach and missed approach
19D.5.3 Asymmetric approach and straight in landing
19D.5.4 Asymmetric approach and circle to land

20 NIGHT FLYING

20.1 BASIC TECHNIQUE
20.1.1 Pre-flight checks
20.1.2 ATC liaison
20.1.3 Taxying differences
20.1.4 Airfield lighting familiarisation
20.1.5 Take-off and climb
20.1.6 Circuit, approach and landing and missed approach

20.2 EMERGENCY PROCEDURES
20.2.1 Engine failure considerations for single engine aeroplanes
20.2.2 Radio and electrical failures
20.2.3 Emergency flare path landing

20.3 ABNORMAL (ASYMMETRIC) OPERATION
20.3.1 Take-off briefing engine failure considerations
20.3.2 Engine failure after take-off and asymmetric climb
20.3.3 Asymmetric circuit and landing
20.3.4 Asymmetric go-around from committal height

20.4 NIGHT NAVIGATION
20.4.1 Map reading differences
20.4.2 Combination of visual and radio-aids navigation

21 AEROBATICS

21.1 BASIC CONTROL TECHNIQUE
21.1.1 Pre-aerobatics checks
21.1.2 Loop
21.1.3 Barrel roll
21.1.4 Slow roll
21.1.5 Stall turn
21.1.6 Roll off the top
21.1.7 Half roll

22 ASYMMETRIC FLIGHT

22.1 BASIC CONTROL TECHNIQUE
22.1.1 Demonstration of asymmetric flight including engine shutdown and restart
22.1.2 The effects of engine failure in straight flight
22.1.3 Control and identification
22.1. The effects of engine failure in turns
22.1.5 The effects of airspeed variations at constant power
22.1.6 The effects of power variations at constant IAS

22.2 CRITICAL AND SAFETY SPEEDS
22.2.1 Critical speed and the factors affecting
22.2.2 The effects of engine failure at speeds above and below Take-off Safety Speed (Vtoss or appropriate V speed if defined for the type)

22.3 PERFORMANCE APPLICATIONS AND CONSIDERATIONS
22.3.1 Engine limitations and handling considerations
22.3.2 Scheduled techniques for level flight, climb, descent and turns
22.3.3 The effects of configuration on performance
22.3.4 The effects of an unfeathered (wind milling) propeller on performance
22.3.5 The effects of weight, altitude and temperature on performance

22.4 TAKE OFF, CIRCUIT, LANDING AND MISSED APPROACH PROCEDURES
22.4.1 Take-off briefing engine failure procedures
22.4.2 Take-off, engine failure and asymmetric climb with checklist drills
22.4.3 Asymmetric circuit, approach and landing with checklist drills
22.4.4 Asymmetric missed approach procedure from committal height with Checklist drills

Appendix 5

Safety and Airspace Regulation Group

Flight Crew Standards

Supplement to Standards Document 10 (Aeroplanes), Version 01

Theoretical Knowledge Oral – Question Bank

INTRODUCTION

The main body of text in CAA Standards Document 10 (Aeroplanes) outlines the administrative procedures for the conduct of instructor assessments of competence for the issue, revalidation, renewal or variation of an instructor certificate. Section 1 of the AoC schedule (AMC 3 FCL.935) comprises a theoretical knowledge ground oral examination. The purpose of the oral examination is to determine the applicant's breadth and depth of knowledge, ability to discuss a variety of topics related to aviation, and the ability to impart such knowledge and understanding to a trainee pilot.

In preparing for this examination the applicant's efforts should be focussed and productive and undue time and effort should not be invested in learning information that one cannot reasonably be expected to retain for more than a few days, or which has little relevance or practical application for a working instructor. Additionally, this supplement provides flight instructor course providers (FIC instructors) with a reference document to complement the ground theoretical knowledge syllabus for the LAPL, PPL, IR and class/type ratings. This document should be brought to the attention of prospective trainee instructors to facilitate personal preparation prior to commencing the course. It should be referred to throughout initial instructor training, and thereafter as required; to prepare for ongoing assessments, for recurrent training, for the removal of instructor restrictions from instructor certificates and to qualify for additional instructional privileges. This supplement also indicates to instructor examiners (FIE) the subjects for which the applicant has had the opportunity to prepare. Though not necessarily exhaustive, the questions contained within this document represent the likely scope and format of the theoretical knowledge oral examination.

For instructors seeking to train new instructors in accordance with FCL.905.FI (i) (FIC instructor), the UK CAA assumes a higher level of competence, depth of knowledge and breadth of experience will be evident during the AoC. For the variation of an FI certificate to add such privileges, in addition to being able to answer these theoretical knowledge questions confidently and correctly, the applicant will be expected to present blueprint examples of ***how*** to answer such questions (as if had they been posed by trainee pilots) and role model effective instructional techniques including demonstrating how to facilitate the teaching and learning process.

If further guidance is required, or if one wishes to comment on the content of this supplement, please contact one of the CAA Staff Flight Examiners.

INSTRUCTOR THEORETICAL KNOWLEDGE ORAL AND LONG BRIEF

The examiner, when considering which questions to ask, will take account of the nature of the assessment of competence and use his or her discretion to select appropriate and relevant questions. For example, an applicant for the CRI (ME) certificate, or for variation of an FI (A) certificate to include ME instructional privileges, may expect a number of the questions to focus on the theory of asymmetric flight and aircraft control and performance with one engine inoperative. Such questions will not be asked however, during an initial FI(R) AoC conducted on SEP

a. Air Law

1. With reference to the appropriate EASA or National document(s), state the rules of the air with regard to:
   - Collision avoidance
   - Right of way in the air
   - Right of way on the ground
   - Flight in the vicinity of an aerodrome
   - Landing and taking off
   - Lights to be displayed
   - Low flying
2. Define QFE, QNH, RPS and Standard Pressure Setting (1013) and explain the practical use of these various altimeter settings for a typical cross-country flight (VFR and/or IFR) in different classes of airspace.
3. Define height, altitude, flight level, transition altitude and transition level. Explain when and where it is appropriate to be flying by reference to height, altitude and flight levels.
4. With reference to an appropriate chart or document, explain the classification and extent of controlled and uncontrolled airspace in the UK.
5. State the dimensions of an ATZ and MATZ and explain the practical considerations for piloting an aeroplane through or in the vicinity of, the airspace associated with an ATZ and/or a MATZ.
6. With reference to an appropriate chart or document, describe the lateral and vertical dimensions of a control zone (CTZ) and control area (CTA). Explain the practical considerations for piloting an aeroplane through or in the vicinity of a CTA and/or a CTZ.
7. State the visual and instrument flight rules (VFR), (IFR) as they apply outside of controlled airspace and explain the relevance of each for the typical private pilot.
8. With reference to a suitable document, explain the conditions required for flight in accordance with the visual flight rules (visual meteorological conditions) for a private pilot on a typical cross-country flight.
9. With reference to a suitable document, explain the requirements for a pilot to operate at night (with and without passengers).
10. Demonstrate the procedure for calculating the onset of official night time.
11. With reference to a suitable document, explain the circumstances in which a pilot (with or without an IMC, IR restricted, en-route IR or instrument rating) may operate in accordance with the instrument flight rules and when a pilot may operate in instrument meteorological conditions.
12. Explain the meaning of the terms “safety altitude” and “minimum safe altitude” (MSA). Explain the relevance of safety altitude and/or MSA for a VFR flight.

13. Explain the relevance of and how to calculate the minimum safe altitude for a flight conducted in accordance with the instrument flight rules.

14. With reference to a suitable document, explain the privileges and limitations of the light aircraft pilot licence (LAPL), private pilot licence (PPL) [or where applicable, the commercial pilot licence (CPL)]. Explain how those privileges and limitations are amended by the inclusion of:

- an IMC rating or IR restricted
- a night rating
- an instrument rating or en-route IR
- an additional aircraft type or class rating

15. With reference to a suitable chart and appropriate document(s), explain the meaning of various airspace restrictions and other areas where activities hazardous to flight may occur including:

- Restricted, Prohibited and Danger areas
- Areas of Intense Air Activity
- High Intensity Radio Transmission Areas
- Glider, Hang Gliding and Parascending Sites
- Free-fall Parachuting Drop Zones

16. Demonstrate how to plan and conduct a flight to operate in the vicinity of, or through, the airspace of a designated danger area.

17. State the air traffic services provided to pilots by ATC or ATSU outside of controlled airspace. Explain the information provided by each level of service and the limitations of the service.

18. Explain the meaning, applicability and relevance of special VFR for the operations of a typical private pilot.

19. Explain how to record flight time in a pilot's logbook.

b. Aircraft General Knowledge

Instruments

20. Explain the basic principles of operation of the Air Speed Indicator (ASI). Describe the errors associated with the ASI and explain how they affect its use.

21. State whether a pressure (or position) error correction (PEC) is applicable for the ASI in your aircraft and if so, where to find information regarding the ASI PEC and the magnitude of the correction.

22. Explain the basic principles of operation of the Vertical Speed Indicator (VSI). Describe the errors associated with the VSI and explain how they affect its use.

23. Explain the basic principles of operation of the pressure altimeter. Describe the errors associated with the pressure altimeter and explain how they affect its use.

24. Demonstrate the checks performed and accuracy required in order for the altimeter in your aircraft to be confirmed as serviceable before flight. State whether a pressure (or position) error correction is applicable for the altimeter in your aircraft and if so, where to find information regarding the magnitude of the correction.

25. Demonstrate the location and operation of the alternate static source (if applicable). State whether a correction is applicable for the ASI, VSI and pressure altimeter in your aircraft following operation of the alternate static source.

26. Describe the properties of a gyroscope. Define real and apparent wander. Explain how the properties of a gyroscope relate to the principles of operation of one or the following:

- An Attitude Indicator
- A Direction Indicator
- A Turn Indicator
- A Turn Co-ordinator

27. With the aid of a model or diagram, explain the principles of operation and practical limitations of the attitude indicator(s) in your aircraft. State the indications and implications of power failure to the AI gyro.

28. With the aid of a model or diagram, explain the principles of operation and practical limitations of the gyroscopic heading reference system in your aircraft. State the indications and implications of power failure to the DI/HSI gyro.

29. With the aid of a model or diagram, explain the principles of operation of the turn indicator/turn co-ordinator in your aircraft. Explain how the TI/TC in your aircraft may be used to accomplish turns onto specific headings and to recover from unusual attitudes. State the indications and implications of power failure to the TI/TC gyro.

30. Explain the principles of operation of the direct indicating (wet) compass. Describe the errors associated with the compass when not in straight and level un-accelerated flight.

Airframe

31. With the aid of a suitable diagram, explain the basic principle of operation of [one or more of] the following flight controls:

- elevator (or stabilator)
- ailerons
- rudder
- trim tab(s)
- flaps
- slats

32. Describe the likely causes and symptoms of a malfunction of one of the flight controls (for example jammed elevator trim or flap motor failure). State and explain the checklist items for abnormal/emergency operation of the system.

33. As a practical exercise (e.g. pre-flight check), indicate and state the function of the various aerials, vents, drains and access points on your aircraft.

34. Explain the form and function of [one or more of] the following control surfaces:

- trim tabs
- horn balances
- mass balances
- strakes
- spades

Powerplant

35. With the aid of a suitable diagram, explain the basic principles of operation of the four-stroke internal combustion engine.

36. With the aid of a suitable diagram, explain the basic principles of operation of a diesel engine.

37. Define ignition advance and ignition retard. Explain why it might be appropriate to advance or retard the ignition and how (or indeed if) this is achieved in a typical aircraft internal combustion engine.

38. With the aid of a suitable diagram, explain the basic principles of operation of the aircraft ignition (magneto) system.

39. State the checks to be performed on the ignition (magneto) system before and after flight. Explain why the checks are performed and describe the symptoms and consequences of a faulty magneto or magneto switch.

40. Define detonation and pre-ignition and explain the likely causes, symptoms and possible remedies for each.

41. With the aid of a suitable diagram, explain the basic principles of operation of a typical float type carburetion system.

42. With the aid of a suitable diagram, explain the basic principles of operation of a typical fuel injection system.

43. Where applicable for aircraft type and with reference to the POH/AFM, demonstrate how to set the mixture control to operate fully rich, at best power mixture, best economy mixture and to select idle cut off.

44. Explain the principles of operation of the normal and alternate air induction system for your aircraft. Describe the causes and symptoms of induction and carburettor icing and likely remedies.

45. With the aid of a suitable diagram, explain the basic principles of operation of a typical engine lubrication system. Demonstrate the normal pre and post flight checks of the system and describe the likely symptoms of a system malfunction.

Systems

46. With the aid of a suitable diagram, explain the basic principles of operation of the undercarriage retraction system. Describe the likely causes and symptoms of a malfunction of the system. State and explain the checklist items for abnormal/emergency operation of the system.

47. With the aid of a suitable diagram, explain the basic principles of operation of a typical light aeroplane fuel system. State the fuel capacity and useable fuel for your aircraft and describe the procedures for managing the fuel, including pre-flight checks for fuel quantity and contamination.

48. With the aid of a suitable diagram, explain the basic principles of operation of a variable pitch propeller. Describe the likely causes and symptoms of propeller over-speed/under-speed. State and explain the checklist items for abnormal/emergency operation of the system.

49. With the aid of a suitable diagram, explain the basic principles of operation of a typical light aeroplane electrical system. Describe the likely causes and symptoms of a malfunction of the system. State and explain the checklist items for abnormal/emergency operation of the system.

50. With the aid of a suitable diagram, explain the basic principles of operation of a typical vacuum system. Describe the likely causes and symptoms of a malfunction of the system. State and explain the checklist items for abnormal/emergency operation of the system.

51. With the aid of a suitable diagram, explain the basic principles of operation of a typical pitot-static system. Describe the likely causes and symptoms of a malfunction of the system. State and explain the checklist items for abnormal/emergency operation of the system.

c. Flight Performance and Planning

52. Draw the curves of Thrust Horsepower (THP) available against THP required for a typical single engine piston aeroplane. On the curve show:

- The minimum speed for level flight
- The maximum speed for level flight
- The speed for maximum rate of climb
- The minimum power speed
- The minimum drag speed
- The effect of increasing altitude

53. Define specific fuel consumption (SFC) and explain the factors affecting SFC.

54. State the general requirements for flying for maximum endurance. Demonstrate, with the use of the flight manual or pilot operating handbook for your aircraft, how to derive practical fuel consumption figures, including endurance information.

55. State the general requirements for flying for maximum range. Demonstrate, with the use of the flight manual or pilot operating handbook for your aircraft, how to derive practical fuel consumption figures, including range information.

56. Describe the forces acting in a steady state level turn. Explain the requirement to increase backpressure and power in order to maintain entry altitude and speed when flying a steep turn.

57. State the theoretical engine, airframe and environmental requirements for a turn with either minimum radius or maximum rate. Describe how to fly your aircraft to achieve the aforementioned turn.

58. Describe the forces acting in a steady state climb. State why the speeds for best angle of climb and best rate of climb are different. Describe how to fly your aircraft to achieve a climb at the best angle and best rate.

59. Describe the forces acting in a steady state descent. State why gliding speeds for maximum range and minimum rate of descent are different. Explain how to fly your aircraft to achieve optimum glide performance.

60. Explain the dangers associated with attempting to “stretch the glide”.

61. With reference to the POH/AFM, demonstrate how to calculate the mass and balance for a representative flight. State the mass and CofG limitations for your aircraft and explain the consequences of attempting to operate outside of these limits.

62. With reference to the POH/AFM, demonstrate how to calculate the take off and landing performance for a representative flight. State whether any additional factors would be advisable/mandatory and explain the effect of the following on take-off and landing performance:

- Weight/altitude/temperature
- Grass
- Contaminated or wet runway
- Obstacles
- Use of flap

63. Demonstrate how to obtain an appropriate NOTAM bulletin for a representative flight. Explain how to interpret NOTAM information including:

- Date, time and duration
- Location and dimensions (radius/altitude)

- Relevance
- Operational limitations and effect

d. Human Performance and Limitations

64. Describe the symptoms of hyperventilation and its association with anxiety. What precautions might be taken to alleviate student anxiety and how might an instructor aid a student to recover from hyperventilation?

65. Explain the likely causes and symptoms of motion sickness. State the precautions to be taken to avoid and actions that might be taken to alleviate motion sickness.

66. State the meaning of the terms, “Stress” and “Arousal” in relation to aviation human performance. Explain why an understanding of the effects of “Stress” and “Arousal” is important for the trainee pilot and instructor.

67. Describe the basic physiology of the inner ear and eustacean tube. Explain the hazards of flying with a cold and the problems that can be experienced during ascent and descent. (This question may also refer to the sinuses.)

68. Describe the basic theory of human information processing and explain how limitations with short-term memory may affect a pilot’s ability to correctly recall lengthy messages or instructions.

69. Describe the symptoms and dangers of carbon monoxide poisoning. State the precautions to be taken to avoid and actions that might be taken to aid recovery from CO poisoning.

70. With the aid of a suitable diagram, explain the basic physiology of vision. State the limitations of human vision with relation to the “see and avoid” principle and describe an optimal visual scan pattern for lookout.

71. With the aid of a suitable diagram, explain the basic physiology of balance. State the limitations of the human balance organs in relation to flight without external visual reference. Explain how knowledge and understanding of such human limitations is important for flight by sole reference to instruments.

72. State the responsibilities of the pilot in command of an aeroplane.

73. State and explain an example of an appropriate self-check mechanism for the private pilot to ensure he/she is mentally and physically prepared for flight.

74. Describe the basic theory of personality types and explain how student pilots may differ in the ways in which they learn new skills.

e. Meteorology

75. Describe the heat processes (energy into and out of the atmosphere) that give rise to “weather”.

76. Define troposphere, tropopause and stratosphere. List the characteristics of the troposphere in terms of gaseous composition, water vapour content, temperature and pressure. Explain why an understanding of the structure of the troposphere is of importance to pilots.

77. State the effect of changes in temperature and pressure on altimeter readings.

78. Explain when it might be appropriate to make a correction to the altimeter reading for temperature, and indicate the magnitude of such a correction.

79. Define dew point. Explain the significance of the dew point to pilots.

The Atmosphere in Horizontal Motion

80. Describe the global forces that give rise to horizontal motion of the atmosphere (wind).

81. Describe how information on wind velocity is provided for the pilot by the forecasting services and by ATC.

82. Explain the basic principles of “Buys Ballot’s law”.

83. Explain why the wind flows around high and low-pressure systems and not from high to low pressure, as might be anticipated by a layman.

84. Define the terms veer and back. Explain the difference between the surface wind velocity and upper winds.

85. Explain the difference between the surface wind over land and sea given the same pressure gradient.

86. Describe the effects of cloud cover on surface wind and give an example of when an understanding of this might be of relevance to a pilot.

87. Describe the normal diurnal variation of wind and give an example of when an understanding of this might be of relevance to a pilot.

88. Explain the development of sea breezes and give an example of when an understanding of this might be of relevance to the pilot.

89. Explain and give an example of how topography and other regional factors may generate or influence local winds (for example Föhn wind, anabatic or catabatic winds).

90. Explain why the wind speed associated with a low pressure system (cyclonic wind) is generally less than the wind speed associated with a high pressure system (anti-cyclonic wind) for the same pressure gradient.

91. Explain why the wind speed associated with a low pressure system at higher latitudes is generally less than that associated with a low pressure system at lower latitudes, for the same pressure gradient.

The Atmosphere in Vertical Motion

92. Explain the meaning of the terms “stability” and “instability” in relationship to the vertical motion of the atmosphere.

93. Explain lapse rate and give typical numerical examples for the environmental (ELR), dry adiabatic (DALR) and saturated (SALR) adiabatic lapse rates. State why the SALR varies with altitude.

94. Describe how the relationship between ELR, DALR and SALR determines vertical motion and the development of cloud and precipitation in the atmosphere.

95. Explain and state the significance of mechanical turbulence, convection, orographic lifting processes and mass ascent/descent on the development of clouds and precipitation in the atmosphere.

96. Explain the föhn effect. Give an example of when an understanding of this might be of relevance to the pilot.

97. Explain the development of and conditions associated with standing waves. Give an example of when an understanding of this might be of relevance to the pilot and state how to recognise standing wave activity.

Visibility

98. Define visibility. Explain the difference between met visibility, in-flight visibility and runway visual range.

99. Describe the factors influencing visibility and explain the difference between determining visibility in daylight and at night.

100. Describe the difference between air-to-ground visibility and reported visibility at ground level. Explain the hazards associated with descending through a haze layer, to make an approach at an airfield that can be seen from directly above.

101. List the main causes and favourable conditions for the formation, persistence and subsequent clearing of haze.

102. Define mist and fog. Explain the conditions associated with the formation, persistence and subsequent clearance of either radiation or advection fog.

Clouds and Precipitation

103. List and describe the basic cloud types.

104. Explain the relationship between the main cloud types and the following processes:

- Frontal activity
- Orographic lift
- Atmospheric instability
- Mechanical turbulence

105. Describe the growth of cloud particles into precipitation.

106. Discuss the significant features of the main cloud types in relationship to aircraft operations.

Icing

107. List the types of icing encountered in cloud, precipitation and clear air.

108. For each type of icing listed in the previous question, describe the associated hazards to aircraft in flight.

109. Explain the conditions associated with the formation of hoar frost on parked aircraft and appropriate precautions to be taken prior to flight.

110. State the significance of latent heat, water temperature and droplet size in determining the type and severity of icing experienced.

111. Explain the effect of aircraft speed, shape and cloud characteristics on the rate of ice accretion.

112. State the effect of kinetic heating and airframe temperature lag on the nature and severity of airframe icing.

113. State the atmospheric and engine operating conditions that pose a significant risk of carburettor icing.

114. Describe how to recognise the formation of engine icing (induction and/or carburettor) and the appropriate use of engine controls to prevent and/or clear engine icing.

115. Explain the principles of operation and limitations of the anti-icing/de-icing equipment on your aircraft.

116. Interpret icing forecast terminology from the Met Form 215.

Thunderstorms

117. State the requirements for and describe the stages of the growth of Cumulonimbus and the development of thunderstorms.

118. Describe favourable pressure patterns for thunderstorm development.

119. Differentiate between air mass/heat thunderstorms and frontal thunderstorms.

120. List the hazards associated with flight in the vicinity of thunderstorms.

Air Masses, Fronts and Pressure Systems

121. Define the term air mass and list the main air masses that affect the UK.

122. Describe the properties of [one of] the air masses that affect the UK with respect to temperature, stability and humidity at source.

123. Describe the changes occurring within the air mass as it travels from the source regions to the UK and state the associated weather conditions (visibility, cloud and precipitation).

124. Define the term 'front'. Draw and illustrate a plan section and cross section of one of the following fronts:

- Warm front
- Cold front
- Occluded front

125. For any given front, indicate movement, slope, 0^{o}C level, tropopause level, air mass disposition, basic cloud structure and rain belts as appropriate.

126. Explain the development of, and weather associated, with an occlusion. State the difference between a warm and cold occlusion.

127. Explain the changes in the following as either a warm or cold front passes overhead:

- Wind direction and strength
- Cloud structure
- Precipitation

128. Identify on a meteorological synoptic chart the following weather systems:

- Anticyclone
- Ridge
- Col
- Trough
- low

High Altitude Meteorology (High Performance Types Only)

129. State the significance of contour charts in forecasting upper winds.

130. Define the term "jetstream." Describe the conditions associated with the development of jetstreams.

131. Demonstrate on a synoptic chart, or with a diagram, the probable location of a jetstream in the atmosphere. Describe the possible benefits and hazards associated with operating in the vicinity of a jetstream.

132. Define clear air turbulence (CAT). Explain the conditions likely to cause CAT and state where CAT is most likely to be encountered.

Interpretation of Meteorological Information

133. With reference to the information provided, (Met Forms 214, 215, TAF and METAR bulletins), interpret the likely weather. Indicate the suitability of the weather for a representative training/private/commercial flight, VFR or IFR as appropriate.

f. Navigation (see also questions in a. Air Law above.)

Visual

134. State the "1 in 60" rule and explain its relevance to pilot navigation.

135. With the aid of a diagram, explain the theory and practical application of [one or more of] the following navigation techniques:

- Standard closing angle
- New track reference
- Drift lines, opening and closing angles
- Feature crawling

136. Explain how to supplement visual navigation techniques with reference to ground based (NDB/VOR/DME) or space based (GNSS) aids to navigation. Discuss how such techniques might enhance navigation accuracy and reduce pilot workload, particularly when navigating in reduced visibility or through congested airspace.

137. Describe an appropriate activity cycle to adopt during a visual navigation exercise.

138. Explain how to carry out a weather avoidance procedure (for example to route around a large rain shower then return to track).

139. Explain how to carry out an unplanned diversion (for example to discontinue a planned leg because of deteriorating weather and re-route towards an alternate destination).

140. Describe suitable actions to take when lost or uncertain of position.

Instrument Flight

141. Define decision altitude/height (DA/H) and minimum descent altitude/height (MDA/H). Explain the difference between DA/H and MDA/H in terms of a pilot's considerations and actions upon arriving at either.

142. Define the term "constant descent final approach (CDFA)." Explain the techniques for flying a non-precision approach as a CDFA, the calculation of procedure minima and the pilot's actions upon reaching minima.

143. Define the term, "required visual reference." Explain the relevance of required visual reference with relation to an instrument approach.

144. Define the term, "circling approach." Explain when and how to conduct a circling approach, including the actions to take in the event of loss of visual reference.

145. Define the term, "aircraft approach category." Explain the relationship between aircraft approach category and instrument approach procedures. State the approach category for the aircraft you operate.

146. Define the term, "approach ban." With reference to a suitable document, explain the legal status of the approach ban and its relevance to instrument approach procedures.

147. Explain how unusually low temperatures might affect the calculation of DA/H and MDA/H.

148. Explain the principles of operation, practical limitations and errors associated with ILS.

149. State the actions required to receive and check ILS signals.

150. Describe the procedure for flying an ILS approach and calculation of personal minima, either with or without glide path information.

151. Explain the principles of operation, practical limitations and errors associated with VOR.

152. Explain the principles of operation, practical limitations and errors associated with DME.

153. State the actions required to receive and check a VOR bearing and DME range.

154. Describe the procedure for intercepting and maintaining a track towards and away from VOR facility.

155. Describe the procedure for intercepting and maintaining a DME arc.

156. Explain the principles of operation, practical limitations and errors associated with GPS.

157. State the actions required to receive and display GPS present position and to navigate to a waypoint using GPS information.

158. Demonstrate how to insert, check and activate a basic flight plan in the GPS unit in your aircraft.

159. Demonstrate how to use the “Nearest” and “Direct to” facility of the GPS unit in your aircraft.

160. Explain how to complement “traditional” VFR navigation planning with the use of GPS.

161. Explain the certification requirements before GPS may be used as BRNAV or PRNAV.

162. Explain the principle of operation, practical limitations and errors associated with ADF.

163. State the actions required to receive and check an NDB bearing.

164. Describe the procedure for intercepting and maintaining a track towards or away from an NDB facility.

165. Describe the procedure for flying a non-precision approach (VOR/NDB or GNSS) and the calculation of personal minima.

166. Explain the basic principles of operation of secondary surveillance radar.

167. State the differences between Mode A, Mode C and Mode S.

168. With reference to a suitable document, explain the requirements of the “standard” ICAO instrument holding pattern. Describe the entry procedures for the three sectors.

169. Explain how to adjust heading and timing in the hold to account for the effect of wind.

170. Explain the procedure for flying an SRA approach and the calculation of personal minima.

171. With reference to a suitable document and/or chart, explain how to select a preferred IFR routing and level(s) from a nominated departure aerodrome in the south of the UK to a nominated destination aerodrome in the north of the UK (or vice versa).

g. Operational Procedures

172. State which aircraft documents are required to be carried on local (A to A) and land away (A to B) flights.

173. Demonstrate how to check the aircraft documents to ensure it is in a fit and legal state for flight, and ascertain what defects and deficiencies (if any) are outstanding. State what entries (if any) are required of the pilot in command.

174. State the requirements for a pilot to:

- Operate at night
- Carry passengers at night

174. With reference to a suitable document demonstrate how to calculate the onset of official “night time”.

175. Demonstrate how to check the validity of a Part-FCL licence and/or National licence and the various ratings, certificates and medical certificate contained therein.

176. State the privileges and limitations of the following ratings and certificates (as appropriate). Explain the validity period of the rating(s) or certificates and requirements to revalidate or renew the rating(s):

- Flight Instructor
- Class rating instructor
- Instrument rating instructor
- SE class
- ME Class

- SET class
- IMC rating or IR restricted
- Instrument rating
- Aeroplane type rating

177. With reference to a suitable document, explain the purpose for wake vortex separation minima and state which figures are applicable for your aircraft for take-off and landing.

178. With reference to a suitable document, explain how to complete and submit a flight plan for a representative VFR and/or IFR flight.

179. With reference to a suitable document explain noise abatement procedures at [a designated airfield or] your home airfield.

180. With reference to a suitable document explain when you must file an MOR.

181. Explain the safety considerations that should be observed before intentional spinning.

182. Explain the differences between a distress call and an urgency call. Give a practical example of when and how to make a distress or urgency call.

h. Principles of Flight

General

183. Define the following terms:

- Relative airflow
- Total reaction
- Lift
- Drag
- Chord line
- Chord length
- Angle of attack
- Centre of pressure
- Wing area
- Mean camber line

184. Explain how lift is generated from a conventional aerofoil section.

185. Sketch and explain the pressure distribution and streamlines around an aerofoil at various angles of attack up to and including the stall.

186. Explain the meaning of Coefficient of Lift (Cl) and list the factors affecting Cl.

187. Explain and illustrate how the Cl varies with angle of attack for a conventional general aviation aerofoil. Illustrate the effect of [two or more of] the following on the AOA/Cl curve:

- Camber
- Aspect ratio
- Shape (i.e. rectangular, tapered, elliptical, swept-back)
- Flaps and Slats

188. Define the following terms:

- Drag

- Zero Lift Drag (also known as profile drag)
- Lift Dependent Drag (also known as induced drag)
- Laminar and turbulent flow
- Transition point, separation point and adverse pressure gradient

189. Explain how the characteristics of the boundary layer affect zero lift drag.

190. Explain the relationship between zero lift drag and airspeed.

191. Explain and illustrate how lift dependent or induced drag varies with the following:

- Angle of Attack
- Weight
- Manoeuvre (Load factor)
- Aspect ratio

192. Construct a Total Drag Curve and explain the relevance of the following speeds:

- Minimum drag speed
- Minimum power speed
- Best EAS/Drag ratio

193. Explain the meaning of Coefficient of Drag (CD) and explain the significance of CD in the drag formula.

194. Construct and explain a graph of zero lift CD and lift dependent CD against angle of attack.

195. Draw a graph to show CL/CD relationship with varying angles of attack. Indicate the position of the best L/D ratio and explain the relevance of this point.

Stability

196. Define the following types of stability:

- Positive
- Neutral
- Negative

197. Explain with the aid of a diagram the difference between static and dynamic stability.

198. Explain how positive static directional stability is achieved and describe how it is affected by:

- Centre of gravity
- Fin and rudder design

199. Explain how positive longitudinal stability is achieved and describe how it is affected by:

- Centre of gravity
- Tail plane design

200. Explain how positive lateral stability is achieved and describe how it is affected by:

- Dihedral
- High or low wing aircraft configuration
- Operation of flap

- Swept back wings

201. Explain aerodynamic damping and the effect of altitude.

202. Explain manoeuvre stability and the effect of altitude.

203. Explain how the interaction of directional and lateral stability can lead to spiral instability or Dutch roll.

Flight Controls

204. Explain how control effectiveness is determined by:

- Size
- Shape
- Position of the control surface
- Speed

205. Explain the meaning of aerodynamic balance when referring to flight controls and describe how aerodynamic balance is achieved with the following:

- Inset hinge
- Horn balance
- Fixed tab
- Trim tab
- Geared tab

206. Explain the meaning of mass balance when referring to flight controls and describe how mass balance is achieved.

207. Explain the terms flexural and torsional flutter.

208. Explain adverse aileron yaw and describe how the following design features may assist in countering it:

- Differential ailerons
- Frieze ailerons
- Aileron/rudder coupling
- Spoilers

Stalling, Autorotation and Spinning

209. Explain the meaning of the term “stall”.

210. Define basic stalling speed and demonstrate where you would find information regarding the basic stalling speed for your aircraft.

211. Discuss the reliability and effectiveness of the following as symptoms and warnings of the approaching stall:

- Speed
- Aircraft attitude
- Control effectiveness
- Stall warning devices
- Buffet

212. Explain how stalling speed is affected by:

- Weight
- Load factor (manoeuvre)
- Thrust
- Use of Flap

213. Explain why an aeroplane may suffer a wing drop at or close to the stall.

214. Explain the loss of roll damping at angles above the critical AOA.

215. Explain the development and describe the symptoms of autorotation.

216. Describe the motion of an aircraft in a developed spin.

217. Define B/A ratio and explain how it affects the spinning characteristics of an aeroplane.

218. Describe the difference between an erect spin and an inverted spin both theoretically and as experienced from the cockpit.

219. Describe the spin recovery actions for your aeroplane for:

- An incipient spin
- A fully developed erect spin

Propeller Theory

220. Show with the aid of a diagram the aerodynamic forces acting on a propeller blade. Explain how these forces vary with propeller RPM and forward airspeed.

221. Explain propeller efficiency and describe when a fixed pitch propeller is at its most efficient in a typical simple single engine aeroplane.

222. Explain the advantages of a variable pitch propeller. Describe the effect of varying throttle settings and forward airspeed on engine RPM and propeller pitch.

223. Define aerodynamic and centrifugal twisting moments and describe how such forces act on a propeller blade.

224. Explain how the following can cause a swing on take-off in a propeller driven aircraft:

- Crosswind
- Asymmetric blade effect
- Wheel drag
- Gyroscopic effect
- Slipstream effect

Additional Multi-Engine Class and Type Rating Questions

225. Define and explain the significance [as appropriate to class/type] of the following:

- Vmca
- Vmcg
- V toss
- V1
- V2
- Vyse
- Vxse

- Critical speed

226. Explain how the following factors affect Vmca and critical speed:
    - thrust
    - centre of gravity
    - altitude
    - feathering

227. Define the term, “Asymmetric committal height (altitude)” and explain the reason for adopting a committal height when operating a multi-engine aircraft.

228. Explain the effect of engine failure:
    - In straight and level flight
    - In a turn
    - Visually
    - On instruments
    - At high power/low power
    - At high speed/low speed

229. State which engine (if any) is the “critical” engine for your aeroplane, and explain why.

230. Describe the forces acting on a multi-engine aeroplane in straight and level, asymmetric flight.

231. Explain why applying up to 5^{o} bank towards the live engine improves performance.

232. State the factors affecting controllability following an engine failure.

233. Explain how to obtain a representative zero thrust setting for a multi-engine aeroplane.

234. State and explain the factors affecting climb performance following engine failure.

i. Training Administration

235. With reference to the appropriate document(s), state the content of the theoretical and practical training and where relevant the skill test schedule for [one or more of] the following licences, ratings or qualifications:
    - EASA Part-FCL LAPL
    - EASA Part-FCL PPL
    - CAA National PPL
    - Single-engine (Land) class rating
    - Single-engine (Sea) class rating
    - Multi-engine (Land) class rating
    - Single-engine turbine class rating
    - Single-pilot type rating
    - Night rating
    - IMC rating or IR restricted
    - Single-pilot single-engine instrument rating
    - Single-pilot multi-engine instrument rating
    - En-route instrument rating

- Aerobatic rating

236. State the administrative requirements and demonstrate completion of the records to be kept, for the appropriate course of instruction.

237. State the administrative requirements and demonstrate completion of the appropriate application forms for issue of the licence or rating (as appropriate) upon completion of the above course of training.

238. State how [one or more of] the following are to be achieved and recorded:

- Familiarisation training (e.g. a new variant within the SEP class)
- Differences training (e.g. variable pitch propeller, tail wheel, a new type or variant within the MEP class, single lever power controls or electronic "glass" flight instrument displays.)
- Revalidation of SE class ratings by experience
- 90 day night currency for carrying passengers
- Night currency for carrying passengers
- NPPL SSEP self certification
- PPL 150nm qualifying cross-country
- CPL 300nm qualifying cross-country

239. State the requirements for the activities of a restricted flight or assistant flying instructor to be supervised and explain the process for removal of the restriction.

j. Additional Questions for Aerobatic Instruction

240. State the requirements for the inclusion of an aerobatic rating in a Part-FCL licence.
241. Indicate the content of an appropriate course of training for the aerobatic rating.
242. State the statute requirements for a safety harness when carrying out aerobatic manoeuvres (ANO Schedule 4).

243. State the Rules of the Air regarding the conduct of aerobatic manoeuvres (ANO rules of air, rule18).

244. Define pilot disorientation. Discuss the following factors and their possible contributory effect on pilot disorientation:

- Flying with a cold
- Flying with an ear infection
- Flying with a poorly defined horizon, poor visibility or over a monochromatic surface such as calm water or cloud
- Sun glare

243. Explain the physiological and psychological causes of motion (air) sickness. Give examples of strategies for:

- Avoiding airsickness
- Coping with airsickness

244. Explain the physiological effects of positive, negative and lateral acceleration (g loading) on a pilot including:

- "Greyout", "blackout" and "redout"
- Methods of combating the effects of g and developing g tolerance

- g induced loss of consciousness (g-loc)

245. Demonstrate, with reference to appropriate aircraft documents (CofA, ARC, Release to Service, Technical Log, Deferred Defect Log etc), that an aeroplane has been correctly maintained, serviced and prepared for spinning and/or aerobatic flight.

246. Demonstrate, with reference to the pilot operating handbook or aeroplane flight manual for a specific machine, that the aeroplane is within the weight and balance limitations for spinning and/or aerobatic flight and indicate the permitted aerobatic manoeuvres.

247. Explain how the following factors may limit or restrict the spinning and/or aerobatic capabilities of an aeroplane:

- Weight
- Centre of gravity
- Fuel quantity, fuel distribution and fuel tank selection
- Baggage
- Passengers

248. State, with reference to the pilot operating handbook or aeroplane manual for a specific machine, the following airframe limitations as applicable:

- Airspeed limits
- g-limits
- Rolling g-limits
- Flick roll limits

249. State, with reference to the pilot operating handbook or aeroplane manual for a specific machine, the following engine and system limitations and considerations as applicable:

- Maximum RPM limit (fixed pitch prop)
- Maximum RPM limit, RPM prohibited range, RPM/MAP limits (VPP)
- Temperature and pressure limits
- Zero, negative g or inverted limits dictated by the fuel system
- Zero, negative g or inverted limits dictated by the oil system

250. Explain how the design of the following systems may limit or restrict the spinning and/or aerobatic capabilities of an aeroplane:

- Oil system
- Fuel system
- Propeller control mechanism (VPP)
- Flight controls
- Undercarriage, brake and parking brake mechanism
- Flaps, slats and slots