Subject No 40   Flight Planning (Aeroplane)

Note: This syllabus is based on Flight Planning for an oceanic IFR flight for a multi engine turbine air transport type aeroplane.

Assessment of this syllabus will be predominantly based on the specific published 'representative' aircraft performance data and appropriate computer generated flight plans. However when required, instruction and assessment should be based on generic or other type specific data.

Appropriate preliminary information is defined as that information contained in the published data pack or that information embedded into individual assessment questions e.g. flight plan components, weather data, additional performance or related 'fuel policy' data.

Each subject has been given a subject number and each topic within that subject a topic number. These reference numbers will be used on 'knowledge deficiency reports' and will provide valuable feed back to the examination candidate. These reference numbers can be common across the subject levels and therefore may not be consecutive.

This syllabus assumes a knowledge and understanding already attained at:

·   PPL and CPL syllabus level

·   Instrument rating (IR) Flight Navigation syllabus level

·   Basic Turbine Knowledge syllabus level.

Any item containing components existing in another syllabus indicates a higher level of understanding is required and/or the advanced practical application of the item is to be considered.

Sub Topic   Syllabus Item

Flight Planning Concepts

40.2   Definitions

40.2.2   Define and explain the use of the following terms in the correct context (include appropriate fuel reserves where applicable):

(a)   point of safe return (PSR);

(b)   inflight revised point of safe return (revised PSR);

(c)   equi-time point (ETP);

(d)   diversion decision point (DDP);

(e)   extended diversion time operations (EDTO);

(f)   cost index (CI);

(g)   performance deterioration allowance (PDA);

(h)   contingency fuel;

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	(i) ISA and temperature deviation (e.g. ISA +10).
40.4	**Extended Diversion Time Operations (EDTO)**
40.4.2	Explain the concept of EDTO.
40.4.4	Identify and describe the aircraft requirements for EDTO.
40.4.6	Identify and explain the route and aerodrome requirements applicable to EDTO.
40.4.8	Identify and explain the critical fuel requirements for EDTO.
40.4.10	Describe the engine failure descent options (Terrain/Fuel critical drift down and Standard drift down) and explain when/why they would be used.
	Flight Planning
	Note: This syllabus requires an understanding of both the ground flight planning phase <u>and</u> the inflight use of a CFP (computer generated flight plan) including the management of inflight planning contingencies.
40.6	**Climb**
40.6.2	Given appropriate preliminary information, use representative aircraft data to determine:
	(a) time/distance to achieve a requested altitude;
	(b) time/distance to permit climb to a requested higher cruise flight level.
40.8	**Cruise**
40.8.2	Given appropriate preliminary information, use representative aircraft data to determine:
	(a) maximum and optimum cruise levels;
	(b) sector times and distances;
	(c) TAS and fuel consumption at specific altitudes;
	(d) maximum weight or temperature at which specific altitude can be attained;
	(e) holding speeds and fuel consumption at standard hold altitudes.
40.10	**Cruise Management**
40.10.2	Given appropriate preliminary information, determine the optimum aircraft weight for a step climb;
40.10.4	Demonstrate the use of appropriate aircraft performance data to evaluate:
	(a) manoeuvre /buffet margins and how they relate to the selection of initial

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and step climb altitudes;

(b)   how a constant CI changes cruising Mach as wind changes.

40.10.6   Explain:

(a)   LRC;

(b)   MRC;

(c)   CI=0;

(d)   Identify and explain the difference between, and the application of: LRC, MRC and CI=0.

40.10.8   Define MOCA, MORA and grid MORA.

40.10.10   Explain the term safety height (SH) as shown on a flight plan.

40.12   Descent

40.12.2   Given appropriate preliminary information, use representative aircraft data to determine:

(a) appropriate CI descent point;

(b) time and distance to descend.

40.14   Fuel Consumption

40.14.2   Given appropriate preliminary information, use representative aircraft data to determine:

(a) sector fuel consumption;

(b) hold and approach consumption;

(c) total flight fuel consumption;

(d) alternate and reserve fuel requirements;

(e) contingency fuel;

(f) total ramp fuel required for departure.

40.16   Equi -Time Points

40.16.2   Given appropriate preliminary information, use representative aircraft data to determine the following ETP's:

(a) normal cruise (ETP);

(b) depressurised cruise (ETPD);

(c) engine-out descent and cruise (ETP1);

Sub Topic	Syllabus Item
	(d) engine-out depressurised cruise (ETP1D).
40.18	**Return points**
40.18.2	Given appropriate preliminary information, use representative aircraft data to determine the (include appropriate fuel reserves where applicable):
	(a) point of safe return (PSR);
	(b) inflight revised point of safe return (revised PSR).
40.20	**Diversion Decision Point**
40.20.2	Explain the identification, function and application of a DDP flight plan.
	Flight Data Extraction
	Note: Identification of any CFP data used to calculate syllabus items is required.
40.22	**Flight Data Extraction**
40.22.2	Given a computer-generated flight plan and representative aircraft data, obtain the following:
	(a) navigation data base validity;
	(b) type of plan (e.g. standard, EDTO, DDP etc);
	(c) planned type of cruise profile (e.g. CI/high speed/low level etc);
	(d) planned initial cruise level;
	(e) planned time/distance/fuel to the initial cruise level;
	(f) planned step-climb points;
	(g) planned EET between any enroute waypoint pairs;
	(h) planned ground speeds;
	(i) planned waypoint wind/temp;
	(j) planned EET to destination;
	(k) planned AUW at any enroute waypoint and at destination;
	(l) time/distance to planned ETP's;
	(m) minimum fuel required at planned ETP's;
	(n) estimated fuel available at planned ETP's;
	(o) plan fuel components not included in the fuel required figure;

Sub Topic	Syllabus Item

(p) identify any limiting weight factor (TOW, ZFW, or LDW);

(q) any specified EDTO enroute alternates as applicable;

(r) airspace/FIR boundary points and what national airspace the aircraft is flying through;

(s) sector safety height (SH).

40.22.4   Given a computer-generated flight plan and representative aircraft data, extract and interpret the information contained in the following flight plan blocks:

(a) Route Description;

(b) Fuel Summary;

(c) Contingency Summary;

(d) Critical Fuel Summary;

(e) Alternate Summary;

(f) Time/Fuel Summaries for ZFW Change.

40.22.6   Given a computer-generated flight plan and representative aircraft data, obtain any of the following based on specified appropriate in-flight time, weight, and fuel performance information:

(a) estimated time/distance/fuel to the initial cruise level (TOC);

(b) ETA for planned step-climb points;

(c) ETA at any enroute waypoint;

(d) ETA at destination;

(e) estimated AUW at any waypoint, and at destination;

(f) estimated time/distance to ETP's;

(g) estimated minimum fuel required at ETP's.

40.22.8   Given appropriate in-flight times, weight, and fuel performance information extract the planned and actual:

(a) average fuel flow for each phase of the flight;

(b) fuel used to an enroute point;

(c) fuel required from a waypoint to destination;

(d) contingency fuel status;

(e) DDP fuel status;

Sub Topic	Syllabus Item

(f) the availability of extra holding fuel;

(g) diversion fuel status;

(h) minimum reserve fuel status;

(i) critical ETP item fuel status;

(j) total fuel required;

(k) landing weight status.

Revision Calculations

40.24   **Revised ETP Calculations**

40.24.2   Given a computer-generated flight plan, representative aircraft data and appropriate in-flight time, weight, and fuel performance information, calculate the following:

(a) ETP for a revised enroute alternate pair;

(b) ETP fuel/time to a revised ETP enroute alternate pair.

40.26   **Revised Alternate, Flight Level and Speed Calculations**

40.26.2   Given a computer-generated flight plan, representative aircraft data and appropriate in-flight time, weight, and fuel performance information, derive the following:

(a) fuel required for a revised destination alternate;

(b) time/fuel required for a lower level flight;

(c) time/fuel required for a high or low speed flight;

(d) time/fuel required for an increased hold requirement at the destination.