

Ground Examination Syllabus

Commercial Pilot's Licence (Aeroplanes)

Airline Transport Pilot's Licence (Aeroplanes)

AIRCRAFT PERFORMANCE SYLLABUS

1 PERFORMANCE

1.1 General Principles

1.1.1 Objectives

1.1.1.1 The Basis and Importance of Aeroplane Performance Assessment

1.1.1.2 The Relationship Between Performance Assessment, Flight Planning and Loading

1.1.2 Definitions, abbreviations and terms used

1.1.2.1 Altitude/Height; pressure/density altitude, gross/net height, screen height, re light altitude, stabilising altitude

1.1.2.2 Temperature; ISA, OAT, TAT, reasons for difference, declared temperature

1.1.2.3 Gross and net performance

1.1.2.4 Speed associated with basic and scheduled aeroplane performance

1.1.2.5 Weight; all weights associated with aeroplane performance

1.1.2.6 Distances; definitions of distances available associated with aeroplane performance including stopway and clearway

1.1.2.7 Effect of runway slope

1.1.3 National Legislation

1.1.3.1 Differences According to State

1.1.3.2 Performance probabilities; a basic understanding of derivation and legislation for the provision of flight safety, to include EROPS and ETOPS where applicable

1.1.3.3 Operational and Airworthiness Requirements; introduction to appropriate AN(G)R and MCAR and JAR.

1.1.3.4 Scheduling of Performance Data

1.1.3.5 Performance Groups; a basic understanding of the relevance and differences between performance groups (according to state)

1.1.4 Elements of Performance Assessment

1.1.4.1 The Aerodrome; distances (refer 1.1.2.), slope (methods of determination), obstructions, runway surface, sources of data

1.1.4.2 Meteorological Data; pressure/density altitude, temperatures (those to be used appropriate to phase of flight) wind components (including regulatory factors), runway state, sources of data

1.2 Performance of Aeroplanes Certificated Under Performance groups A and B MCAR 1996.

1.2.1 Definitions, Abbreviations and Terms Used

1.2.1.1 Any which are new to this performance group; notably, V_{ef} (engine failure speed), V_1 , V_r , V_2 , V_{mbe} , V_{stop} , V_{mcg} , V_{mca} , definition of balanced field

- length
- 1.2.2 Take off requirements
 - 1.2.2.1 Operational AN(G)R and Airworthiness (BCAR/JAR) Requirements.
 - 1.2.2.2 WAT Limit: climb gradients, effect of pressure altitude and temperature and flap configuration
 - 1.2.2.3 Take-off Distances: derivation of the take-off distance required, take-off run required, emergency distance (accelerate-stop distance), scheduling of performance data for the above requirements, effect of aeroplane weight, pressure altitude and temperature, runway slope and wind velocity, wind velocity and flap configuration
 - 1.2.2.4 Runways: effect of grass and soil, contamination
 - 1.2.2.5 Use of Aeroplane Flight Manual Data and Charts; determination of maximum permitted take-off weights (MTOW)
- 1.2.3 Climb performance
 - 1.2.3.1 Use of Aeroplane Flight Manual Data (all engines operating) effect of aeroplane weight, pressure, altitude, temperature and wind, determination of rate of climb/gradient, determination of recommended and optimum climb speeds (best angle of climb, best rate of climb) flap retraction speeds, time-to climb calculations for reaching cruise altitude
- 1.2.4 Cruise performance
 - 1.2.4.1 Use of Aeroplane Flight Manual Data (all engines operating); determination of maximum cruise altitude, buffet boundary protection, cruise control (power settings, speeds, and fuel consumption for maximum range and endurance) speed/range trade-offs for optimum performance, effects of the use of maximum continuous power settings
 - 1.2.4.2 Use of Aeroplane Flight Manual Data (one engine inoperative); as for 1.2.4.1 determination of stabilizing altitude/weight, determination of drift down, range and optimum speed, effect of re-light altitude on drift down, drift down procedures (engine bleeds etc.).
- 1.2.5 Descent and landing performance
 - 1.2.5.1 WAT Limit; climb gradients, effect of pressure altitude and temperature, effect of engine bleeds.
 - 1.2.5.2 Landing Distance; effect of aeroplane weight, effect of pressure altitude and temperature, runway slope and wind velocity, state regulatory factors pertaining to the above
 - 1.2.5.3 Runways: effect of grass and soil, contamination
 - 1.2.5.4 Use of Aeroplane Flight Manual Data; determination of maximum permitted planned landing weight (regulatory safety factors), determination of approach and landing speeds (V_{at}), determination of maximum permitted planned landing weight and landing distance required- for wet/dry, slippery/contaminated runway and descent and landing performance calculations for alternate aerodrome, re-assessment of landing performance overhead destination/alternate aerodrome (parameters to be used)
- 1.2.6 Optional Procedures
 - 1.2.6.1 Noise Abatement Procedures; effect on climb performance
 - 1.2.6.2 Variable Thrust Take-Off; principles of variable thrust take-off, limitations. methods of determining thrust required with regard to ambient conditions at a given aerodrome, effect of reduced thrust on take-off distances, effect of reduced thrust on take-off speeds (V_1 , V_r), effect of reduced thrust on climb

- performance and obstacle clearance, procedures to be used
- 1.2.6.3 Increased V2 Procedure; principles of increased V2 procedure, limitations, effect on take-off distances (take-off speeds climb performance; obstacle clearance), significant speeds involved
- 1.2.6.4 Performance effect associated with the minimum equipment list (MEL)