

SRINIVASAN ENGINEERING COLLEGE, PERAMBALUR
DEPARTMENT OF AERONAUTICAL ENGINEERING
AE 1014 AIR TRAFFIC CONTROL AND AERODROME DESIGN

2 MARKS QUESTIONS WITH ANSWERS

PART-I

2 MARKS RELATED TO AIR TRAFFIC CONTROL

1. Define Air traffic.
All aircraft in flight or operating on the maneuvering area of an aerodrome.
2. Define Air traffic advisory service.
A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans.
3. Define Air traffic control clearance.
Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.
4. Define Air traffic control service:
A service provided for the purpose of:
 - a) preventing collisions:
 - 1) between aircraft, and
 - 2) on the manoeuvring area between aircraft and obstructions; and
 - b) expediting and maintaining an orderly flow of air traffic.
5. Define Air traffic control unit.
A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.
6. Define Air traffic flow management (ATFM):
A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.
7. Define Air traffic service.
A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).
8. Define Air traffic services airspaces.
Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

9. Define Air traffic services reporting office.
A unit established for the purpose of receiving reports concerning air traffic services
10. Define Air traffic services unit.
A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.
11. Define Airway.
A control area or portion thereof established in the form of a corridor.
12. Define ALERFA.
The code word used to designate an alert phase.
13. Define Alerting service.
A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.
14. Define Alert phase.
A situation wherein apprehension exists as to the safety of an aircraft and its occupants.
15. Define Alternate aerodrome.
An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing. Alternate aerodromes include the following:
Take-off alternate. An alternate aerodrome at which an aircraft can land should this become necessary shortly after takeoff and it is not possible to use the aerodrome of departure.
En-route alternate. An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route.
ETOPS en-route alternate. A suitable and appropriate alternate aerodrome at which an aeroplane would be able to land after experiencing an engine shutdown or other abnormal or emergency condition while en route in an ETOPS operation.
Destination alternate. An alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing.
16. Define Approach control service.
Air traffic control service for arriving or departing controlled flights.
17. Define Approach control unit.
A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.
18. Define Area control centre.
A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.
19. Define Area control service.

- Air traffic control service for controlled flights in control areas.
20. Define Area navigation (RNAV).
A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.
 21. Define Area navigation route.
An ATS route established for the use of aircraft capable of employing area navigation.
 22. Define Control area.
A controlled airspace extending upwards from a specified limit above the earth.
 23. Define Controlled aerodrome.
An aerodrome at which air traffic control service is provided to aerodrome traffic.
 24. Define Distress phase.
A situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.
 25. Define Downstream clearance.
A clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft.
 26. Define Emergency phase.
A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.
 27. What is Final approach?
That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,
 - a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or
 - b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
 - 1) a landing can be made; or
 - 2) a missed approach procedure is initiated.
 28. Define Flight information region.
Airspace of defined dimensions within which flight information service and alerting service are provided.
 29. Define Flight information service.
A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.
 30. Define Flight level.

A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

31. Define Obstacle.

All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:
a) are located on an area intended for the surface movement of aircraft; or
b) extend above a defined surface intended to protect aircraft in flight; or
c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

32. Define Performance-based navigation (PBN).

Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

33. Define Radio navigation service.

A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

34. Explain SIGMET information.

Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

35. Define Special VFR flight.

A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

36. Define Taxiing

Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

37. Define Terminal control area.

A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes

38. Define VFR.

The symbol used to designate the visual flight rules.

39. Define VFR flight.

A flight conducted in accordance with the visual flight rules.

40. Define Visual meteorological conditions (VMC).

Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima

41. Define Visual meteorological conditions (VMC).

Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

42. Define Waypoint.
A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:
Fly-by waypoint. A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or
Flyover waypoint. A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

PART-II

2 MARKS RELATED TO AERODROME DESIGN

43. Define Aerodrome.
A defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.
44. Define Aerodrome beacon.
Aeronautical beacon used to indicate the location of an aerodrome from the air.
Aerodrome Certificate. A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.
45. Define Aerodrome elevation.
The elevation of the highest point of the landing area.
46. Define Aerodrome identification sign.
A sign placed on an aerodrome to aid in identifying the aerodrome from the air.
47. Define Aerodrome reference point.
The designated geographical location of an aerodrome.
48. Define Aerodrome traffic density.
a) Light. Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements.
b) Medium. Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements.
c) Heavy. Where the number of movements in the mean busy hour is of the order of 26 or more per runway or typically more than 35 total aerodrome movements
49. Define Aeronautical beacon.
An aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the earth.
50. Define Aeronautical ground light.
Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

51. Define Aeroplane reference field length.
The minimum field length required for take-off at maximum certificated take-off mass, sealevel, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certifying authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.
52. Define Aircraft classification number (ACN).
A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category
53. Define Clearway.
A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height
54. Define Declared distances.
 - a) Take-off run available (TORA). The length of runway declared available and suitable for the ground run of an aeroplane taking off.
 - b) Take-off distance available (TODA). The length of the take-off run available plus the length of the clearway, if provided.
 - c) Accelerate-stop distance available (ASDA). The length of the take-off run available plus the length of the stop way, if provided.
 - d) Landing distance available (LDA). The length of runway which is declared available and suitable for the ground run of an aeroplane landing.
55. what is meant by Dependent parallel approaches?
Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.
56. Define Displaced threshold.
A threshold not located at the extremity of a runway.
57. Define Effective intensity.
The effective intensity of a flashing light is equal to the intensity of a fixed light of the same colour which will produce the same visual range under identical conditions of observation.
58. Define Ellipsoid height (Geodetic height).
The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.
59. Define Fixed light.
A light having constant luminous intensity when observed from a fixed point.
60. Define Frangible object.

An object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

61. Define Geodetic datum.

A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

62. Define Geoid.

The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

63. Define Geoid undulation.

The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

64. Define Identification beacon.

An aeronautical beacon emitting a coded signal by means of which a particular point of reference can be identified.

65. Define Independent parallel approaches.

Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

66. Define Independent parallel departures.

Simultaneous departures from parallel or near-parallel instrument runways.

67. Explain types of Instrument runway.

One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

a) Non-precision approach runway. An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach.

b) Precision approach runway, category I. An instrument runway served by ILS and/or MLS and visual aids intended for operations with a decision height not lower than 60 m (200 ft) and either a visibility not less than 800 m or a runway visual range not less than 550 m.

c) Precision approach runway, category II. An instrument runway served by ILS and/or MLS and visual aids intended for operations with a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 350 m.

d) Precision approach runway, category III. An instrument runway served by ILS and/or MLS to and along the surface of the runway and:

A C intended for operations with a decision height lower than 30 m (100 ft), or no decision height and a runway visual range not less than 200 m.

B C intended for operations with a decision height lower than 15 m (50 ft), or no decision height and a runway visual range less than 200 m but not less than 50 m.
C C intended for operations with no decision height and no runway visual range limitations.

68. Define Landing direction indicator.
A device to indicate visually the direction currently designated for landing and for take-off.
69. Define Maneuvering area.
That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.
70. Define Marker.
An object displayed above ground level in order to indicate an obstacle or delineate a boundary.
71. Define Marking.
A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.
72. Define Movement area.
That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the Maneuvering area and the apron(s).
73. Define Near-parallel runways.
Non-intersecting runways whose extended centre lines have an angle of convergence/divergence of 15 degrees or less.
74. Define Non-instrument runway.
A runway intended for the operation of aircraft using visual approach procedures.
75. Define Obstacle.
All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.
76. Define Obstacle free zone (OFZ).
The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.
77. Define Orthometric height.
Height of a point related to the geoid, generally presented as an MSL elevation.
78. Define Pavement classification number (PCN).
A number expressing the bearing strength of a pavement for unrestricted operations.
79. Define Primary runway(s).

- Runway(s) used in preference to others whenever conditions permit.
80. Define Road-holding position.
A designated position at which vehicles may be required to hold.
 81. Define Runway.
A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.
 82. Define Runway end safety area (RESA).
An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.
 83. Define Runway guard lights.
A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.
 84. Define Runway-holding position.
A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/ MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.
 85. Define Runway strip.
A defined area including the runway and stopway, if provided, intended:
 - a) to reduce the risk of damage to aircraft running off a runway; and
 - b) to protect aircraft flying over it during take-off or landing operations.
 86. Define Runway visual range (RVR).
The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line
 87. Define Safety Management System.
A system for the management of safety at aerodromes including the organizational structure, responsibilities, procedures, processes and provisions for the implementation of aerodrome safety policies by an aerodrome operator, which provides for control of safety at, and the safe use of, the aerodrome.
 88. Define segregated parallel operations.
Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.
 89. Define Signal area.
An area on an aerodrome used for the display of ground signals.
 90. Define Station declination.

An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

91. Define Stopway.

A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

92. Define Switch-over time (light).

The time required for the actual intensity of a light measured in a given direction to fall from 50 per cent and recover to 50 per cent during a power supply changeover, when the light is being operated at intensities of 25 percent or above.

93. Define Take-off runway.

A runway intended for take-off only.

94. Define Taxiway.

A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

a) Aircraft stand taxilane. A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

b) Apron taxiway. A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron

95. Define Taxiway strip.

An area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.

96. Define Threshold.

The beginning of that portion of the runway usable for landing.

97. Define Touchdown zone.

The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

98. Define Usability factor.

The percentage of time during which the use of a runway or system of runways is not restricted because of the cross-wind component.