Infrastructures del Transport Aeri

Name:

Mid Term exam - Spring semester 2015

Short questions: answer them with one word or one sentence in the space provided.
Correct answer: +1 point – Incorrect answer: -1point – Blank answer: 0 points.

Regarding the GPS, h**ow many satellites in view** are needed, at least, to estimate the receiver's position?

When talking about a navigation system, what performance metric measures t**he percentage of time** that accuracy, integrity and continuity requirements are met?

Generally speaking, which separation layer **is more conservative** in terms of separation distance: procedural control or air traffic management?

Enumerate the **four** unknowns in the following GPS observation equation from the receiver point of view: $p_i = \sqrt{(x_i - x)^2 + (y_i - y)^2 + (z_i - z)^2} + T \cdot c_0$

How the letter "**L**" is pronounced, according to the international radiotelephony alphabet used in aviation?

How an air traffic controller would call an aircraft labeled as **BAW132**?

Give **one (1)** example of **safety indicator.**

Give **the name** of **three (3)** different **aircraft operators.**

Enumerate the **three (3)** different ways a **FIX** can be defined.

Is the ATIS a system of the ATS or the ATFM?

Regarding the ITA lab ATC simulations, what was the correct **callsign** for one of the **sectors** simulated: *"Ponent" or "Barcelona Control"?*

Short questions: answer them inside the space provided.
Correct answer: [variable] – Incorrect answer or blank answer: 0 points

[1.0 points] Give the name of **at least three legs** of a visual airfield traffic pattern:

[1.5 points] Explain what are the IATA slots.

[1.5 points] ATM capacity depends on several factors. Give **two (2)** examples and explain why.

[2 points] Explain what is an ATC sectorisation.

[2 points] Do you think the radionavigation infrastructure influences Airspace Management? Why?

INFRAESTRUCTURES DEL TRANSPORT AERI (ITA)
Mid Term Exam - Spring semester 2015

Correct answer: +1 point – Incorrect answer: -1/3 points – Blank answer: 0 points
For each question **only one answer** is correct

Assignatura 00213 – Centre 300 – Parcial 01 – Permutacio A:0 B:1 C:2 D:3
Use the **right** side numbering to mark your answers into the optical mark recognition sheet
Marking a case of the first answer line selects the answer, marking a case into the second line cancels it

Permutacio A

1. Which is the Uncertainty Phase
   (a) Palerfa
   (b) Incerfa
   (c) Alerfa
   (d) Detresfa
2. In a descent, at which moment the pilot sets the altimeter to the QNH setting?
   (a) At the transition level.
   (b) At the crossover altitude.
   (c) At FL100.
   (d) At the transition altitude.
3. Which of the following methods shall be used to define a VFR reporting point?
   (a) Overflying a radionavigation facility.
   (b) The intersection of a VOR radial and a NDB course.
   (c) An significant landmark.
   (d) Some timing after overflying a radionavigation facility.
4. The control in charge of realise the sequencing and merging of aircraft arriving at a busy airport is...
   (a) the approach control.
   (b) the ground control.
   (c) the area control.
   (d) the tower control.
5. Which of the following statements is correct with respect to the exit flight level (XFL) of an aircraft inside an ATC sector?
   (a) The strategic controller defines and ensures the XFL by clearing the aircraft to it.
   (b) The ATC supervisor defines the XFL and the strategic controller ensures it by clearing the aircraft to it.
   (c) The strategic controller of the following sector defines the XFL and the strategic controller of the current sector ensures it by clearing the aircraft to it.
   (d) The strategic controller defines the XFL and the tactical controller ensures it by clearing the aircraft to it.
6. Strategic ATFM should:
   (a) Balance flights next day with available ATC Capacity.
   (b) Manage current flights with existing ATC capacity.
   (c) Define the national airspace policy and predetermined airspace structures.
   (d) Match long-term demand and needed ATC capacity.
7. What is a VOLMET?
   (a) A radio station broadcasting meteorogical information of a certain area, including some relevant airports.
   (b) A radio station broadcasting meteorogical information of a specific airport, indicating as well, the runway in service, the preferred IFR approach, the transition level and any other relevant information regarding airport operations.
   (c) A special message issued by the International Volcanic Meteorology Office, regarding volcanic activity.
   (d) A radio station broadcasting volcanic activity information in a certain area.
8. What is the airspace flow program (AFP)?
   (a) the north american ASM program for route congestion.
   (b) the north american program to modernise ATM.
   (c) the north american program to modernise ATS.
   (d) the north american ATFM program for airspace congestion.
9. Regarding the flexible use of airspace (FUA) concept, the first level (strategic level) deals with:
   (a) The definition of national airspace policy and predetermined airspace structures.
   (b) The day-to-day allocation of airspace, according to users requirements.
   (c) The definition of the sectorisation and capacity of the military airways.
   (d) The real-time use and management of available airspace.
10. According to Figure 2...
    (a) Turns in the airfield traffic pattern are always to the left.
    (b) Turns in the airfield traffic pattern are always to the right.
    (c) Turns in the airfield traffic pattern are to the left for runway 31 and to the right for runway 13.
    (d) Turns in the airfield traffic pattern are to the right for runway 31 and to the left for runway 13.
11. Which is the main problem of current version of GPS if used for civil aviation?
    (a) Its lack of integrity.
    (b) Not enough vertical accuracy for en-route procedures.
    (c) Not enough accuracy for en-route procedures.
    (d) Its lack of availability.
12. With our small aircraft, which is NOT equipped with any VHF radio..
    (a) we can only fly in airspace G.
    (b) we can only fly in airspace F or G.
    (c) it is not legal to fly in civil airspace without a radio.

(d) we can only fly in airspace E, F or G.

13. An approach procedure using a Localiser as principal guidance system in the final approach segment is...

    (a) a Localiser cannot be used as principal guidance system in the final approach segment.

    (b) a non-precision approach.

    (c) a precision approach.

    (d) an APV approach.

14. Which of the following statements is **false**?

    (a) Not all airports have published STARs.

    (b) In general, all aircraft begin the descent when overflying the first fix of the STAR.

    (c) Not all airports have published SIDs.

    (d) A SID procedure can only be executed in IFR.

15. What is the most important characteristic of controlled airspace?

    (a) the aircraft needs a clearance to enter.

    (b) separation services are always provided.

    (c) all answers are equally important and characterize controlled airspaces.

    (d) aircraft must be equipped with a transponder to enter.

16. In a conventional IFR holding, which leg is typically a guided leg?

    (a) The outbound leg.

    (b) Both inbound and the outbound legs are always guided.

    (c) The inbound leg.

    (d) In a IFR holding there are no guided legs.

17. Some limitations of the introduction of CDAs in a given procedure include that:

    (a) the total flight times will be always increased with respect nominal operations.

    (b) the noise reduction due to the CDAs will not improve the area close to the airport.

    (c) the fuel consumption will not be reduced with respect nominal operations.

    (d) the thrust can not be adjusted during the descend.

18. Which of the following statements is correct?

    (a) The aircraft operator must compute and publish the OCA in the charts used by their pilots.

    (b) The appropriate national administration must aprove the MDA computed by the aircraft operators.

    (c) The aircraft operator must compute and publish the OCA in the AIP charts.

    (d) The appropriate national administration must compute and publish the MDA in the AIP charts.

19. A racetrack procedure...

    (a) is a type of holding pattern.

    (b) None of the other answers are correct.

    (c) is when an aircraft uses an active runway to taxi in the opposite direction from which it will take off or has landed.

    (d) could be, for instance, a 45/180 procedure turn.

20. Which of the following ATFM initiatives is the most widely used in Europe and in the U.S.?

    (a) Re-routering.

    (b) Ground stop.

    (c) Call for release.

    (d) Air holding.

21. What is a TSA (temporary segregated area)?

    (a) a volume of airspace temporary reserved for IFR terminal manoeuvers where VFR traffic cannot transit under any circumstance

    (b) a volume of airspace temporary reserved for IFR terminal manoeuvers where VFR traffic might transit under an ATC clearance

    (c) a volume of airspace temporary reserved and allocated for specific use where civil traffic cannot transit under any circumstance.

    (d) a volume of airspace temporary reserved and allocated for specific use where civil traffic might transit under an ATC clearance.

22. In a climb, at which moment the pilot sets the altimeter to the standard setting?

    (a) At the transition altitude.

    (b) At FL100.

    (c) At the transition level.

    (d) At the crossover altitude.

23. In airspace class C, separation services are provided...

    (a) only between two conflicting IFR flights.

    (b) to all IFR and VFR flights in the airspace.

    (c) only between two conflicting VFR flights.

    (d) between two conflicting IFR flights and between an IFR conflicting with a VFR.

24. Air Traffic Control (ATC) services shall be provided to:

    (a) All IFR flights.

    (b) All aircraft known by the ATS.

    (c) All VFR flights in airspace classes B, C, and D.

    (d) None of the previous answers are correct.

25. A secondary objective of air traffic flow management (ATFM) is...

    (a) all the answers are correct.

    (b) to monitor the network operations.

    (c) to monitor the aeronautical inforamation publications (AIP).

    (d) to monitor the CNS infrastructure.

26. Regarding Figure 2, what does the point *E*cho (E) in the chart indicate?

    (a) an NDB.

    (b) a visual reference point for the departure procedure.

    (c) a visual reference point for the arrival procedure.

    (d) a VOR.

27. Regarding the ITA ATC laboratory simulations, in how many sectors was the Barcelona TMA airspace divided?

    (a) 2: BCN and GRN

    (b) 4: CAT-N, CAT-S, CAT-W and CAT-E

    (c) 3: PON, MED and LLE

    (d) 2: CAT-W and CAT-E

28. Which of the following CFMU systems can provide historical data to generate future possible demand scenarios?

    (a) The RCAT
    (b) The DWH
    (c) The EAD
    (d) The ENV

29. The MDA...

    (a) None of the other answers are correct.
    (b) is the minimum altitude for circling approaches, while the DA is the minimum altitude for straight-in approaches.
    (c) is the altitude that once reached the pilot must decide whether to continue or abort a non-precision approach.
    (d) is the minimum altitude to overfly the runway threshold, just before landing.

30. What was the sector CAT-W in the ITA ATC laboratory simulations?

    (a) a TMA approach sector.
    (b) a CTR sector in Barcelona for the West plan configuration.
    (c) a UIR en-route sector.
    (d) a FIR en-route sector.

31. If an aircraft loses its CFMU slot while on ground the controller should:

    (a) Request the airline to fill a new flight plan in order to obtain an new slot.
    (b) The controller does not consider the slots allocated to departing aircraft.
    (c) Clear the aircraft to take-off as soon as possible.
    (d) Send a message to the CFMU informing about the delay and clear the aircraft to take-off as soon as possible.

32. Alerting services shall be provided to...

    (a) As far as practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic services.
    (b) For all aircraft provided with ATC service.
    (c) All are correct.
    (d) To any aircraft known or believed to be the subject of unlawful interference.

33. What is the main drawback of the very high frequency (VHF) spectrum for air navigation purposes?

    (a) In order to avoid mutual interference, two distant transmitters must use different frequencies.
    (b) The VHF spectrum is not used in air navigation due to its bad spectral behaviour.
    (c) VHF radio waves refract in the atmosphere and, therefore, the interference of the overall system is increased.
    (d) In order to avoid mutual interference, two close transmitters must use different frequencies.

34. Which of the following transponder codes indicates *unlawful interference*?

    (a) 7500.
    (b) None of the other answers is correct.
    (c) 7700.
    (d) 7600.

35. Which is the correct order of priorities (from the highest to the lowest) when flying an aircraft?

    (a) Aviate, Navigate and Communicate.
    (b) Aviate, Communicate and Navigate.
    (c) Communicate, Navigate and Aviate.
    (d) Communicate, Aviate and Navigate.

36. Airspace management (ASM) initiatives or strategies are usually:

    (a) implemented in real time by the initiative of an air traffic controller.
    (b) tested by several fast-time simulations and studies.
    (c) proof mathematically and solved analytically .
    (d) implemented in real time by the initiative of the supervisor of an ATC center.

37. Regarding Figure 1, how is the FAF of the approach to runway 11 defined?

    (a) above AST.
    (b) above AV.
    (c) at the intersection of courses 118^o and 343^o.
    (d) there is no FAF in this approach.

38. Which of the following controlled airspace zones is sized to accommodate, approximately, all the aircraft flying standard terminal arrival routes?

    (a) The CTA.
    (b) The CTR.
    (c) The ATZ.
    (d) The TMA.

39. An IFR aircraft is flying in RVSM airspace with heading 110^o, following the *odd-even* rule to assign a flight level, a possible flight level for the flight could be:

    (a) FL320
    (b) FL335
    (c) FL325
    (d) FL330

40. Which of the following answers is correct?

    (a) the ATC supervisor designs the size and shape of the different ATC sectors as a function of the traffic demand in his/her control center.
    (b) all answers are correct.
    (c) the ATC supervisor decides the best regulation to apply in case the traffic demand exceeds the capacity in one or more sectors of his/her control center.
    (d) the ATC supervisor decides the best sectorisation to apply as a function of the traffic demand in his/her control center.

41. The length of a CDA, given a typical cruise altitude used by the majority of comercial airliners, is of the order of:

    (a) 80 NM.
    (b) 300 NM.
    (c) 160 NM.
    (d) 40 NM.

42. Which of the following statements is true regarding TCAS?

    (a) TCAS provides separation provision between aircraft.
    (b) TCAS is a cooperative collision avoidance system.

(c) TCAS is a non-cooperative collision avoidance systems.

(d) None of other answers is correct.

43. Which transponder mode transmits only the transponder code and the barometric altitude of the aircraft?

(a) Mode S.

(b) Mode C.

(c) Mode B.

(d) Mode A.

44. What is the primary inforamtion sent by ATC dependencies to the CFMU?

(a) slots and rerouterings.

(b) aircraft flight plans.

(c) accurate weather data.

(d) sector and airport capacities.

45. Which of the following information items is not typically given by a flight information service?

(a) Minimum descent altitudes for a specific approach.

(b) Volcanic activity in a certain area.

(c) The frequency of a specific radionavigation aid.

(d) Traffic informaiton assisting the pilot to avoid collision conflicts.

46. ICAO regulations classify the aircraft according to their speed at the threshold as:

(a) CAT-I, CAT-II, CAT-IIIa, CAT-IIIb and CAT IIIc.

(b) A, B, C, D, E and H.

(c) Heavy, Medium and Light.

(d) APV-I and APV-II.

47. An approach procedure using a Locator as principal guidance system in the final approach segment is...

(a) a precision approach.

(b) an APV approach.

(c) a non-precision approach.

(d) a Locator cannot be used as principal guidance system in the final approach segment.

48. Which of the following CFMU systems implements the Computer Assisted Slot Allocation (CASA) algorithm?

(a) The ETFMS

(b) The RPL

(c) The PREDICT

(d) The IFPS

49. In which of the following procedures the final approach segment will start at the FAP?

(a) In an ILS approach.

(b) In a VOR approach.

(c) In a Localizer approach.

(d) In any approach that the intermediate segement ends at the *end of turn*.

50. An airspace sector has been regulated and its maximum capacity is set to 6 aircraft per hour. The table below depicts the Estimated Time Over (ETO) the concerned sector for a given set of aircraft. What is the ATFM delay that would be assigned to EZY078 according to the computed assisted slot allocation (CASA) algorithm?

Flight	**ETO**	**Flight**	**ETO**
BAW123	10:01	DAL077	10:24
IBE222	10:06	BAW444	10:40
RYR069	10:07	AFR022	11:02
EZY078	10:11	AZA333	11:05

(a) 4 minutes.

(b) No delay.

(c) 19 minutes.

(d) 1 minute.

51. Regarding Figure 1, how is the MAPt of the approach to runway 11 defined?

(a) a Locator.

(b) an NDB.

(c) a Localiser.

(d) the threshold of runway 11.

52. What system is the precursor of the secondary surveillance radar (SSR)?

(a) Tha automatic dependence surveillance (ADS)

(b) SSR is a novel system, without any precursors.

(c) Identification friend or foe (IFF).

(d) None of them are correct

53. Regarding Figure 1, the radionavigation aid labeled as AV is

(a) a VOR.

(b) a Locator.

(c) an NDB.

(d) a Localiser.

54. Which of the following statements is correct?

(a) None of the other answers are correct.

(b) A VOR approach procedure is always a NPA procedure (*).

(c) The answers marked with (*) are correct.

(d) A NPA approach procedure is always a VOR procedure (*).

55. Regarding Figure 1, what is the intermediate segment of the approach to runway 11?

(a) the leg with course 298^o, from AST to the intersection with the leg with course 343^o.

(b) there is no intermediate segment in this approach.

(c) the leg with course 118^o, from the end of turn to the intersection with the leg with course 343^o.

(d) the leg with course 343^o.

56. Which of the following statements is correct?

(a) In general, the majority of aircraft will start the descent from the cruise altitude when starting the STAR (*).

(b) None of the other answers are correct.

(c) Both answers marked with a (*) are correct.

(d) In general, the majority of aircraft will arrive at the cruise altitude when finishing the SID (*).

57. In which of the following airspace classes VFR flights are not allowed?

    (a) VFR flights are allowed in all airspace classes, providing that they are conveniently equipped with VHF radio equipment and secondary radar transponder if so required.

    (b) in airspace class G.

    (c) in airspace class E.

    (d) in airspace class A.

58. One of the advantages of performing CDAs is that:

    (a) the conflicts with other traffic are reduced.

    (b) all the answers are correct.

    (c) the environmental impact of the operations is reduced.

    (d) the capacity of arrivals at the airport is increased.

59. Which of the following sentences is correct, regarding the Letters of Agreement (LoA) in the context of ATS?

    (a) The air traffic controllers must have a comprehensive knowledge of the LoA affecting their sectors.

    (b) The LoA are published in the AIP.

    (c) The aircraft operators must have a comprehensive knowledge of the LoA affecting their flights.

    (d) All answers are correct.

60. What is a NOTAM?

    (a) It is a notice or advisory that contains useful information for pilots or potential hazards along a flight route or at a location, such an airport.

    (b) It is a type of airspace without air traffic control.

    (c) It is the name that receives the aeronautical radiotelephony alphabet.

    (d) It is a collision hazard information typically given by a flight information service to a pilot.

61. Which of the following controlled airspace zones is sized to accommodate all the aircraft flying in an aerodrome traffic pattern (downwind, base, final)?

    (a) The TMA.

    (b) The CTR.

    (c) The CTA.

    (d) The ATZ.

62. The ground-based augmentation system (GBAS) working principle is based on:

    (a) None of the other answers are correct.

    (b) the receiver autonomous integrity monitoring (RAIM) principle.

    (c) an additional satellite that broadcasts the GPS errors.

    (d) the similarity of the errors for receivers located "not far" from each other.

63. A VFR aircraft is flying in RVSM airspace with heading 295^o, following the *odd-even* rule to assign a flight level, a possible flight level for the flight could be:

    (a) FL130

    (b) FL120

    (c) FL135

    (d) FL125

64. Which physical transmission layer is NOT used by the ACARS?

    (a) Satellite communication.

    (b) High Frequency (HF) subnetwork.

    (c) CPDLC subnetwork.

    (d) Very high frequency (VHF) subnetwork.

65. Which of the following elements is **not included** in an IFR clearance delivery?

    (a) the transponder code (squawk).

    (b) the altimeter setting.

    (c) the destination airport.

    (d) the cruise flight level.

66. A functional airspace block (FAB) is:

    (a) a synonym of airspace sector

    (b) a restricted or prohibited volume of airspace

    (c) an initiative of the single European sky that establishes airspace blocks regardless of the different state boundaries

    (d) a portion of flexible used airspace (FUA)

67. Regarding Figure 1, the initial approach segment to runway 11, starting at AST IAF is

    (a) a racetrack procedure.

    (b) a racetrack procedure followed by a 45/180 procedure turn.

    (c) a 45/180 procedure turn.

    (d) an NDB course.

68. During the descend of an aircraft performing a CDA and with the assumptions done in the WP1 of your project:

    (a) The speed of the aircraft changes.

    (b) The weight of the aircraft changes.

    (c) The thrust of the aircraft is constant.

    (d) The angle of descend is constant.

69. Imagine you are providing Air Traffic Control services within a sector in the middle of the ocean, with NO radar coverage and no ADS information. How could you provide such services in these conditions?

    (a) Without radar coverage or ADS information, Air Traffic Control services cannot be provided.

    (b) By means of position reports, flight plan information and visual acquisition of the aircraft.

    (c) By means of position reports, flight plan information and transponder codes.

    (d) By means of position reports and flight plan information.

70. An ILS approach is generally a:

    (a) Circling to approach and a precision approach.

    (b) Straight-in approach and a precision approach.

    (c) Circling to approach and a non precision approach.

    (d) Straight-in approach and a non precision approach.

71. Regarding the ITA ATC laboratory simulations, in how many sectors was the Barcelona UIR divided?

    (a) 2: BCN and GRN

    (b) 4: CAT-N, CAT-S, CAT-W and CAT-E

    (c) 3: PON, MED and LLE

    (d) 2: CAT-W and CAT-E

72. Regarding Figure 1, the missed approach segment is composed by:

    (a) two dead reckoning legs.

    (b) the NDB course 047 followed by a dead reckoning leg.

    (c) the NDB course 047.

    (d) the NDB course 047 followed by a direct NDB course.

73. Regarding Figure 1, the initial approach segment to runway 11, starting at AV IAF is

    (a) a racetrack procedure followed by an NDB course.

    (b) there is no initial approach segment for the approach starting at this IAF.

    (c) an NDB course followed by a 45/180 procedure turn.

    (d) a racetrack procedure.

74. In a Locator approach, the approach minima are given by:

    (a) A minimum descent altitude and a minimum obstacle clearance altitude.

    (b) A minimum descent altitude and a minimum visibility.

    (c) A minimum descent altitude.

    (d) A decision altitude and a mimimum visibility.

75. Regarding Figure 1, what is the final approach segment to runway 11?

    (a) an NDB course.

    (b) a dead reckoning leg.

    (c) a Locator course.

    (d) there is no final segment in this approach.

76. In which of the following processes, the class of an airspace (A, B, C, D, E, F or G) is determined?

    (a) In AirSpace Management (ASM).

    (b) In Air Traffic Flow and Capacity Management (ATFCM).

    (c) In the provision of Air Traffic Services (ATS).

    (d) In the provision of Air Information Services (AIS).

77. In which case you could find an approach procedure with no decision height?

    (a) In a Heavy category approach.

    (b) In an ILS CAT-III approach.

    (c) In a circling to approach.

    (d) In an E category approach.

78. Airspace Management (ASM) deals with:

    (a) the publication of the airspace types and classes, and potential changes or updates, to the aircraft operators.

    (b) all the answers are correct.

    (c) the analysis of the demand and capacity imbalances and the application of regulations.

    (d) the analysis and allocation of ATS capacities.

79. Which of the following statements is NOT a new concept/system regarding the **communications** in the future CNS systems for ATM?

    (a) Global Navigation Satellite System (GNSS).

    (b) Controller-Pilot DataLink Communications (CPDLC).

    (c) Reduced VHF frequency spacing (8.33 kHz).

    (d) Aircraft Communications Addressing and Reporting System (ACARS).

80. Which of the following options is NOT a source of information for the ATC?

    (a) Visual acquisition.

    (b) Voice position reports.

    (c) All the other options are in fact a source of information for the ATC.

    (d) Surveillance systems (PSR, SSR, ADS, etc).

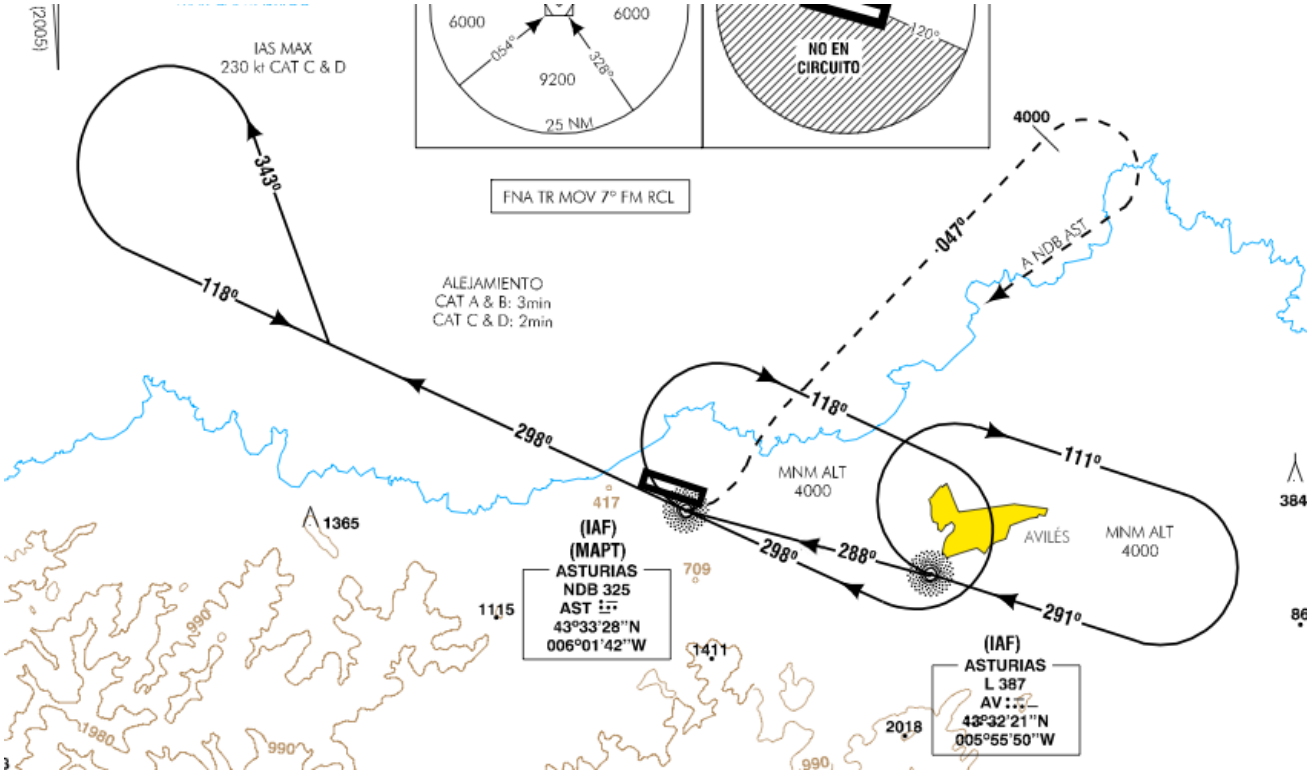

Figure 1: Snippet from Asturias instrument approach chart

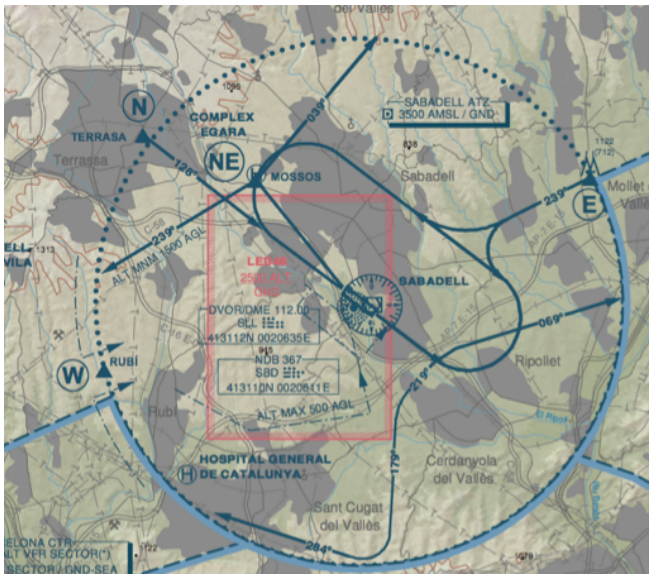

Figure 2: Airfield traffic pattern

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Correct answers

Pregunta	PERM. A	PERM. B	PERM. C	PERM. D
P 01	b	b	c	b
P 02	a	b	c	b
P 03	c	d	d	d
P 04	a	a	a	a
P 05	d	b	a	c
P 06	d	d	d	b
P 07	a	a	d	a
P 08	d	b	c	c
P 09	a	d	c	b
P 10	d	c	c	a
P 11	a	a	a	d
P 12	d	d	a	b
P 13	b	a	b	c
P 14	b	a	a	c
P 15	a	a	d	c
P 16	c	b	c	b
P 17	b	c	d	a
P 18	b	c	a	b
P 19	b	c	c	c
P 20	a	b	c	d
P 21	c	a	a	a
P 22	a	d	c	c
P 23	~~d~~	a	b	b
P 24	d	a	b	a
P 25	b	b	c	d
P 26	c	c	c	c
P 27	d	c	b	d
P 28	b	d	c	b
P 29	a	b	~~c~~	d
P 30	a	b	b	a
P 31	a	b	b	c
P 32	c	a	a	b
P 33	d	d	d	a
P 34	a	d	c	b
P 35	a	a	d	b
P 36	b	d	c	d
P 37	d	b	c	c
P 38	d	b	a	d
P 39	d	b	d	b
P 40	d	d	a	b
P 41	c	a	b	b
P 42	b	b	d	b
P 43	b	d	c	d
P 44	d	c	b	c
P 45	a	c	a	d
P 46	b	d	d	a
P 47	c	a	b	a
P 48	a	a	~~b~~	c

P 49	a	d	c	a
P 50	c	b	c	c
P 51	b	c	b	c
P 52	c	b	b	b
P 53	b	a	d	d
P 54	b	c	a	d
P 55	b	b	a	d
P 56	b	d	a	b
P 57	d	a	d	a
P 58	c	b	a	d
P 59	a	d	d	b
P 60	a	c	b	a
P 61	d	c	b	a
P 62	d	d	d	a
P 63	d	b	d	b
P 64	c	a	d	d
P 65	b	b	b	a
P 66	c	a	b	b
P 67	c	b	b	c
P 68	a	c	c	b
P 69	d	c	d	a
P 70	b	c	c	a
P 71	c	b	c	a
P 72	d	a	d	b
P 73	c	a	d	a
P 74	b	c	b	d
P 75	a	a	d	c
P 76	a	a	c	a
P 77	b	a	a	c
P 78	d	c	d	b
P 79	a	a	d	b
P 80	c	c	a	b