

INFRASTRUCTURES DEL TRANSPORT AERI (ITA)

Final Exam - Fall semester 2020

January 20th 2021

You have Permutation CODE 0 – GROUP 00

For each question **only one** answer is correct: Correct: +1 test point - Incorrect: -1/3 test points - No answer: 0 points

1. Which of the following items highly depends on the CNS (communications, navigation and surveillance) infrastructure available?
 - (a) The design of ATS sectors.
 - (b) the on-board cooperative collision avoidance systems.
 - (c) the international radiotelephony alphabet.
 - (d) the ATFM slot allocation algorithm.
2. Imagine Barcelona's El Prat airport (which has 3 runways). The airport needs to do some maintenance in runway 07L-25R meaning this runway will be closed for a whole week. This fact is known with a couple of months in advance. Which of the following answers is correct?
 - (a) Some airlines will be forced to cancel some flights arriving/departing Barcelona airport.
 - (b) Some airlines will be forced to deviate some flights to surrounding airports, such as Girona or Reus airports.
 - (c) Very likely, there will be ATFM delays for flights leaving from or arriving to Barcelona airport.
 - (d) Very likely, Barcelona airport will reduce the number of IATA slots allocated for that week.
3. Which of the following indicators could be representative to measure flight efficiency in a terminal manoeuvring area?
 - (a) The average number of people exposed above a certain noise level.
 - (b) The average length of trajectory level-offs in departures and/or arrivals.
 - (c) The number of aircraft executing approaches for a given period of time.
 - (d) The number of air traffic controllers divided by the amount of controlled time, and for a given period of time.
4. Which of the following indicators could be representative to measure safety in a Terminal Manoeuvring Area (TMA)?
 - (a) The number of TCAS resolution advisories (RA) in a given period of time.
 - (b) The average length of trajectory level-offs in departures and/or arrivals.
 - (c) The average departure delay due to ATFM measures.
 - (d) The number of aircraft executing approaches in a given period of time.
5. What separation procedure is mainly used in oceanic airspace?
 - (a) Radar separation.
 - (b) Self separation.
 - (c) Procedural separation.
 - (d) TCAS-only separation.
6. ICAO regulations classify the aircraft according to their wake turbulence as:
 - (a) Heavy, Medium and Light.
 - (b) A, B, C, D, E and H.
 - (c) CAT-I, CAT-II, CAT-IIIa, CAT-IIIb and CAT IIIc.
 - (d) APV-I and APV-II.
7. Typically, the minimum vertical separation between two aircraft in RVSM airspace is:
 - (a) 10000ft
 - (b) 1000ft
 - (c) 100ft
 - (d) 10ft
8. Which of the following statements is correct?
 - (a) Tromboning procedures in terminal airspace are mainly designed to improve the efficiency of the flights, if compared with continuous descent operations.
 - (b) Tromboning procedures in terminal airspace are mainly designed to improve airspace and airport capacity, if compared with holding patterns.
 - (c) Tromboning procedures in terminal airspace are one of the collision avoidance layers.
 - (d) All other answers are correct.
9. When the intruding aircraft is equipped with a transponder without altitude reporting capability, the TCAS (Traffic Collision Avoidance System) issues a:
 - (a) traffic advisory and vertical resolution advisory.
 - (b) traffic advisory only.
 - (c) traffic advisory and horizontal resolution advisory.
 - (d) traffic advisory, vertical and horizontal resolution advisory.
10. Schedule (or IATA) slots...
 - (a) are defined in European airports twice a year.
 - (b) are defined early in the morning in European airports.
 - (c) are defined early in the morning in European airports, only if there is a demand/capacity imbalance.
 - (d) are defined by the CFMU at any time when a demand/capacity imbalance exists.
11. Which of the following pieces of aeronautical information could potentially appear in an ATIS message?
 - (a) "... traffic at 11 o'clock at 2NM, 200ft below, Cessna 172 crossing from left to right..."
 - (b) "... sectorisation in Barcelona TMA from 10h to 12h is 11 Victor..."
 - (c) "... transition level is seven zero, ..."
 - (d) All answers are correct.
12. A VFR aircraft is cruising with heading 130°. According to the ICAO flight level allocation scheme (*odd-even* rule), a possible flight level for this flight could be:
 - (a) FL130
 - (b) FL135
 - (c) FL140
 - (d) VFR flights do not fly using flight levels, but Altitudes.
13. Regarding transition level/altitude, which is the correct statement?
 - (a) When climbing, pilots must change the altimeter setting from STD to QNH.
 - (b) STD = QNH if and only if pressure at sea level equals to 1013.25 hPa at the specific region/airport.
 - (c) When descending, pilots must change the altimeter setting from STD to QNH at the specific transition altitude.
 - (d) None of the other answers are correct.

14. 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 ATZ.
 - (b) The CTR.
 - (c) The TMA.
 - (d) The CTA.
15. What features are taken into account when designing the size and shape of ATC sectors?
 - (a) The actual traffic demand, based on submitted flight plans by aircraft operators.
 - (b) The route structure.
 - (c) The forecast weather conditions.
 - (d) All answers are correct.
16. In a VOR approach, the approach minima are given by:
 - (a) A decision altitude and a minimum visibility.
 - (b) A minimum descent altitude.
 - (c) A minimum descent altitude and a minimum obstacle clearance altitude.
 - (d) A minimum descent altitude and a minimum visibility.
17. In a NDB approach procedure, the decision to land or to execute a missed approach must be taken, at the latest...
 - (a) when reaching the MDA.
 - (b) when reaching the DA.
 - (c) when reaching the OCA.
 - (d) when reaching the MAPt.
18. Regarding future concepts in airspace management, which of the following statements is correct?
 - (a) A functional airspace block (FAB) is as an airspace block based on operational requirements and established regardless of State boundaries.
 - (b) The flexible use of airspace (FUA) initiative aims at designing airspace sectors regardless State boundaries.
 - (c) Europe does not need further airspace initiatives as airspace sovereignty is fully delegated to the European Union.
 - (d) The USA have similar problems as Europe regarding the airspace sovereignty and sectorisation issues.
19. What is a TSA (temporary segregated area)?
 - (a) a volume of airspace temporary reserved for IFR terminal manoeuvres where VFR traffic might transit under an ATC clearance
 - (b) a volume of airspace temporary reserved for IFR terminal manoeuvres where VFR traffic cannot transit under any circumstance
 - (c) a volume of airspace temporary reserved and allocated for specific use where civil traffic might transit under an ATC clearance.
 - (d) a volume of airspace temporary reserved and allocated for specific use where civil traffic cannot transit under any circumstance.
20. A secondary objective of air traffic flow and capacity management (ATFCM) is...
 - (a) to maximize the use of available airspace resources and coordination among them.
 - (b) not only slot allocation but also optimization of the network capacity.
 - (c) to monitor the network operations.
 - (d) all the answers are correct.
21. Which of the following causes might trigger ATFM regulations?
 - (a) Bad weather conditions.
 - (b) Lack of aerodrome capacity.
 - (c) Special events such as large scale military exercises.
 - (d) all the answers are correct.
22. Pre-tactical ATFM should:
 - (a) Balance flights next day with available ATC Capacity.
 - (b) Match long-term demand and needed ATC capacity.
 - (c) Manage current flights with existing ATC capacity.
 - (d) Define the national airspace policy and predetermined airspace structures.
23. Which of the following answers regarding the airfield traffic pattern is correct?
 - (a) Airfield traffic patterns are only defined for IFR flights executing circling to approach procedures.
 - (b) Standard airfield traffic patterns are for IFR flights, while non-standard patterns are for VFR flights.
 - (c) Standard airfield traffic patterns are at 1000 ft above the aerodrome elevation and with left turns.
 - (d) All the other answers are correct.
24. Aeronautical Information Services (AIS) are composed by:
 - (a) CNS, ATM, Search and Rescue, AIS, and Meteorology services.
 - (b) Alert services, flight information services and air traffic control.
 - (c) ASM, ATFM and ATS.
 - (d) AIP, NOTAM and CIRC.
25. Visual approaches with prescribed tracks...
 - (a) are typically used in the US (even at major airports) and for some circling-to-approach procedures.
 - (b) are only published for VFR flights.
 - (c) are only used as contingency procedures and must be designed by the operator of the aircraft.
 - (d) do not longer exist nowadays.
26. In what situation an approach procedure cannot be a straight-in approach?
 - (a) when the angular difference between the final track alignment and the runway track exceeds a given value*
 - (b) when the final descent gradient exceeds a given value*
 - (c) both answers marked with a (*) are correct.
 - (d) in case the procedure is a non-precision approach.
27. Airspace Management (ASM) is responsible for:
 - (a) all the answers are correct.
 - (b) alert, information and control services.
 - (c) avoiding air traffic demand exceeding capacity.
 - (d) the design of the ATS sectors.
28. What is the primary information sent by ATC dependencies to the Network Manager?
 - (a) sector and airport capacities.
 - (b) flight plans.
 - (c) accurate weather data.
 - (d) slots and reroutings.
29. What is a Flow Management Position (FMP)?
 - (a) a special position within an ATC area control center devoted to ATFM issues and interfacing the center with the Network Manager.
 - (b) the European implementation of ATFM, managed by Eurocontrol.
 - (c) the results of running the Network Manager PREDICT system the day before of operations (D-1) allowing Eurocontrol to define the ATFM measures that will be applied the D day.

- (d) the Network Manager system (or facility) that processes the flight plans sent by the aircraft operators.
30. Which of the following NM systems can provide historical data to generate future possible demand scenarios?
- The DWH
 - The EAD
 - The ENV
 - The RCAT
31. Which of the following Network Manager systems deals with the flight plans sent by aircraft operators?
- The IFPS
 - The ETFMS
 - The ENV
 - The RCAT
32. Flight information services shall be provided to...
- all aircraft provided with ATC services (*).
 - all aircraft provided with alert services (*).
 - only VFR flights.
 - the two answers labeled with (*) are correct.
33. Which of the following is a clear objective of the air traffic control (ATC) service?
- To expedite and maintain an orderly flow of air traffic.
 - To provide advice and information useful for the safe and efficient conduct of flights.
 - To notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.
 - All answers are correct.
34. Air Traffic Control (ATC) services shall be provided to:
- All VFR flights in airspace classes B, C, and D.
 - All IFR flights.
 - All aircraft known by the ATS.
 - None of the other answers is correct.
35. Which of the following transponder codes indicates *unlawful interference*?
- 7500.
 - 7600.
 - 7700.
 - None of the other answers is correct.
36. When talking about the Short Term Conflict Alert (STCA) system, which of the following statements is **wrong**?
- The STCA function alerts the controller to potential aircraft to aircraft collisions prior to loss of separation.
 - The STCA does not take into account the possible clearances given to the aircraft.
 - Future aircraft positions are estimations based on the velocity vectors of the aircraft.
 - The STCA communicates with the on-board TCAS and when a TCAS alarm triggers, also does the STCA alarm and vice-versa.
37. A VFR flight is flying inside an airspace of class E. The air traffic controller is responsible to separate it from:
- all other IFR flights.
 - all other VFR flights.
 - all other VFR and IFR flights.
 - the controller has no separation responsibility with VFR flights in airspace class E.
38. Which air navigation service is the responsible to disseminate the rules of the air that apply to a specific country?
- The airspace management (ASM) service of the country.
 - The flight information service (FIS) of the country.
 - The aeronautical information service (AIS) of the country.
 - The aerodrome traffic zone (ATZ) services of the country.
39. In which situation, the visual contact with aircraft is the main data gathering source for an air traffic controller?
- for the tower dependency.
 - for the approach control dependency in non busy airports.
 - for the IFR clearance delivery dependency.
 - Nowadays, visual contact with aircraft is not used as source of information by ATC anymore.
40. North Atlantic control typically requires the aircraft crew to:
- Report their position only when requested by the ATC.
 - Report periodically their position every 2h.
 - Report periodically their position every 10° of longitude.
 - Switch-off the transponder.
41. In the frame of ATS, who is responsible for executing transfers of aircraft between two ATC sectors?
- The tactical controller.
 - The supervisor controller.
 - The planner controller.
 - None of the other answers is correct.
42. Which of the following statements is correct with respect to the exit flight level (XFL) of an aircraft inside an ATC sector?
- 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.
 - The ATC supervisor defines the XFL and the strategic controller ensures it by clearing the aircraft to it.
 - The strategic controller defines and ensures the XFL by clearing the aircraft to it.
 - The strategic controller defines the XFL and the tactical controller ensures it by clearing the aircraft to it.
43. In the context of air traffic control (ATC), which type of information we would typically find in a letter of agreement (LoA)?
- The clearances to cross a temporary reserved area (TRA).
 - The exit flight levels of certain ATC sectors.
 - The definition of the standard instrumental departures of the airport.
 - All answers are correct.
44. An aircraft has just landed at a major airport and has vacated the runway. In order to reach its gate at the terminal, an active runway needs to be crossed. Which control is responsible to deliver the needed clearance to cross the runway?
- The tower control.
 - The delivery control.
 - The ground control.
 - The approach control.
45. What ATC dependency is typically in charge to issue the landing clearance?
- The en-route control.
 - The approach control.
 - The tower control.
 - The IFR clearance delivery.
46. At present, which is the principal communications method in continental Europe to link pilots with air traffic controllers?
- VHF voice communications.
 - HF voice communications.
 - Data-link communications.

- (d) Satellite based communications.
47. Which of the following statements is NOT a new concept/system regarding the **communications** in the future CNS systems for ATM?
- Reduced VHF frequency spacing (8.33 kHz).
 - Global Navigation Satellite System (GNSS).
 - Aircraft Communications Addressing and Reporting System (ACARS).
 - Controller-Pilot DataLink Communications (CPDLC).
48. In the context of ATFM, what is the CTOT (calculated take-off time)?
- The original take-off time of an aircraft before it is affected by an ATFM regulation.
 - The take-off time as calculated by the airport operator.
 - The take-off time as calculated by the air navigation service provider.
 - The new take-off time assigned to an aircraft affected by an ATFM regulation.
49. Which physical transmission layer is mainly used for ATC communications when aircraft are flying over populated continental regions?
- A Very high frequency (VHF) subnetwork.
 - Satellite communication.
 - A High Frequency (HF) subnetwork.
 - All answers are correct.
50. In an hypothetical scenario with controller to pilot data link communications (CPDLC)...
- there is no need for VHF radiotelephony.
 - there is no need for collision avoidance systems.
 - the capacity of the ATS sectors will significantly increase.
 - procedural control will be mandatory.
51. Which of the following options is correct, when talking about an ILS?
- the glideslope is the ground-based system and the localiser is the on-board system, both sending the appropriate navigation signals.
 - the localiser is the ground-based system and the transponder is the on-board system, both sending the appropriate navigation signals.
 - the localiser and the glideslope are ground-based systems that send different navigation signals.
 - the localiser and the glideslope are ground-based systems that send the same redundant navigation signal.
52. What is the main difference between a Locator and a Localiser?
- they are the same radionavigation system.
 - the Locator provides 3D guidance, while the Localiser provides only 2D guidance.
 - the Locator is essentially the same system as the Localiser, but with a lower radio coverage.
 - None of the other answers is correct.
53. Using GPS, own-ship position can be determined...
- by means of the Doppler effect.
 - by measuring the relative velocity to the satellites, whose velocity vectors are known.
 - by measuring the distance to the satellites, whose positions are known.
 - None of the other answers is correct.
54. Which of these statements is correct:
- The SBAS geostationary satellites compute the position of the user receiver (like, for instance an aircraft) and send this information to this user with at least 4 satellites to ensure a certain level of redundancy.
 - The SBAS geostationary satellites send to the user receiver different kinds of information, which are then used by this receiver to improve integrity and accuracy in the positioning.
 - The SBAS geostationary satellites only mimic the GPS satellites in order to improve the availability of the system.
 - The SBAS geostationary satellites provide advanced features such as ADS-B in remote areas (like oceans).
55. Which of the following examples shows how ASM can improve airport capacity?
- by removing the holding patterns in the arrivals to Heathrow airport allowing more continuous descent approaches.
 - by replacing tromboning procedures in Frankfurt with different holding patterns strategically located in the STARs and approaches.
 - by allowing parallel visual approaches in San Francisco in good weather conditions.
 - ASM cannot improve airport capacity.
56. Which of these statements is correct:
- In order to compute a GPS position, the receiver needs to have at least 3 GPS satellites in sight.
 - In order to compute a GPS position, the receiver needs to have at least 3 GPS satellites in sight. Nevertheless, for civil aviation a minimum of 4 GPS satellites are needed in order to meet the required accuracy.
 - In order to compute a GPS position, the receiver needs to have at least 4 GPS satellites in sight.
 - None of the other answers is correct.
57. Which is the European stand-alone GNSS system?
- the WAAS.
 - the LAAS.
 - the EGNOS.
 - the Galileo.
58. What is an airspace opening scheme?
- It defines how the shape of the sector assigned to a specific air traffic controller will change along the day.
 - It defines the sequence of different sector configurations planned along the day.
 - It defines the number of open sectors at the beginning of the day.
 - It defines the maximum number of open sectors along the day.
59. Which is the **main reason** that explains why the aviation industry has developed ground or satellite based augmentation systems for GPS?
- in order to enhance GPS positioning accuracy.
 - in order to meet the requirements for integrity and continuity of service needed in civil aviation.
 - in order to enhance navigation capabilities in oceanic or remote areas.
 - in order to augment the coverage of GPS.
60. Which of the following surveillance systems can detect an aircraft that is not willing to "cooperate"?
- The primary surveillance radar.
 - The secondary surveillance radar.
 - The ADS.
 - The TCAS
61. Which transponder mode transmits only the transponder code of the aircraft?
- Mode A.

- (b) Mode B.
(c) Mode C.
(d) Mode S.
62. Where the automatic dependent surveillance - contract (ADS-C) is mainly used?
- (a) In high air traffic density areas.
(b) In oceanic (and remote) areas.
(c) In low air traffic density areas.
(d) Currently, ADS-C is not being used anywhere yet.
63. What does *dependent* mean, in the acronym of ADS-B?
- (a) that all ADS-B messages rely on the performance of the navigation system on-board the aircraft.
(b) that the ADS-B messages rely on the performance of the communication system on-board the aircraft.
(c) that the ADS-B messages rely on the performance of the ground surveillance system (such as secondary radar).
(d) that the ADS-B messages rely on the performance of the ground air traffic control working position.
64. What is the en-route phase?
- (a) The phase of the flight where the aircraft is at a constant cruise altitude.
(b) The phase of the flight that follows the departure procedure.
(c) The phase of the flight that precedes the descent.
(d) All answers are correct.
65. Which is the principal method of navigation for VFR flights?
- (a) dead reckoning.
(b) radar vectoring.
(c) RNAV.
(d) Locator courses.
66. Which of the following statements is correct?
- (a) Non-precision approaches always require a VOR or an NDB as main radionavigation system to provide guidance in the final approach segment.
(b) Non-precision approaches are executed when the ILS Localiser is not available.
(c) Non-precision approaches are executed when the ILS Localiser is not available.
(d) None of the other answers is correct.
67. In Europe, when a strike (union action) from French ATC is expected for the next week...
- (a) ATFM regulations take place.
(b) IATA regulations take place.
(c) airspace sectors are redesigned creating new sectorisations capable to handle the maximum amount of traffic demand.
(d) some airports outside France may be closed.
68. Regarding an approach procedure, which of the following items is a responsibility of the aircraft operator
- (a) to compute the minimum descent altitude or decision altitude.
(b) to compute the obstacle clearance altitude.
(c) to compute the minimum safety distance with other conflicting procedures in the same area.
(d) all other answers are correct.
69. The MDA...
- (a) is the minimum altitude to start an IFR approach procedure.
(b) is used in VFR operations, while the DA is used in IFR operations.
(c) is the lowest altitude to which descent is authorized on the final approach segment if no sufficient visual references are met.
(d) None of the other answers are correct.
70. The OCA...
- (a) is the minimum descent altitude for VFR flights.
(b) is the lowest altitude the pilot should have a clear view of the runway or airport, otherwise a missed approach procedure must be initiated.
(c) is the altitude from which a procedure becomes a Non Precision Approach.
(d) None of the other answers are correct.
71. Which of the following statements is correct?
- (a) Aircraft operators publish their approach charts in the AIP.
(b) The appropriate national administration may compute a lower bound for the MDA and publish it in the AIP charts.
(c) The appropriate national administration may compute the DA and enforce the operator to publish that value in their charts.
(d) All the other answers are correct.
72. A procedure turn 45/180...
- (a) is a type of holding pattern.
(b) is a type of initial approach segment.
(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) None of the other answers is correct.
73. In a precision approach, the final segment ends:
- (a) at the MAPt.
(b) at the FAF or FAP.
(c) at the end of turn.
(d) when reaching the DA while following the final approach track.
74. Regarding Figure 1, the radionavigation aid labeled as AV is
- (a) an NDB.
(b) a Locator.
(c) a VOR.
(d) a Localiser.
75. Regarding Figure 1, the initial approach segment to runway 11, starting at AST IAF is...
- (a) a 45/180 procedure turn.
(b) a racetrack procedure.
(c) a racetrack procedure followed by a 45/180 procedure turn.
(d) an NDB course.
76. Regarding Figure 1, the missed approach segment is composed by:
- (a) two dead reckoning legs.
(b) two NDB courses.
(c) a dead reckoning leg followed by an NDB course.
(d) an NDB course followed by a dead reckoning leg.
77. Regarding Figure 1, how is the MAPt of the approach to runway 11 defined?
- (a) a Locator.
(b) a Localiser.
(c) an NDB.
(d) the threshold of runway 11.
78. Regarding Figure 1, how is the FAF of the approach to runway 11, starting at AST IAF, defined?
- (a) there is no FAF in this approach.
(b) above AST.

INFRASTRUCTURES DEL TRANSPORT AERI (ITA)

Final Exam - Fall semester 2020

Correct answers

Question	CODE 0	CODE 1	CODE 2	CODE 3
P 01	a	b	d	b
P 02	c	b	a	c
P 03	b	c	b	a
P 04	a	a	b	d
P 05	c	b	a	d
P 06	a	a	a	c
P 07	b	a	a	a
P 08	b	d	c	b
P 09	b	c	a	b
P 10	a	d	a	a
P 11	c	a	c	c
P 12	b	c	b	a
P 13	b	a	c	d
P 14	a	d	b	b
P 15	b	b	b	c
P 16	d	a	d	a
P 17	d	a	d	c
P 18	a	b	b	c
P 19	d	c	a	d
P 20	d	d	a	a
P 21	d	c	a	c
P 22	a	d	d	a
P 23	c	b	b	d
P 24	d	b	c	d
P 25	a	a	a	a
P 26	c	c	d	c
P 27	d	a	d	d
P 28	a	b	a	c
P 29	a	c	a	c
P 30	a	c	c	b
P 31	a	c	b	b
P 32	a	c	c	a
P 33	a	c	c	a
P 34	d	d	c	a
P 35	a	d	a	c
P 36	d	a	a	b
P 37	d	a	d	a
P 38	c	b	a	b
P 39	a	b	d	d
P 40	c	a	d	d
P 41	a	b	c	c
P 42	d	b	b	a
P 43	b	c	c	d
P 44	a	c	b	b
P 45	c	d	b	c
P 46	a	c	d	a
P 47	b	d	d	c
P 48	d	b	b	c

P 49	a	a	a	d
P 50	c	d	a	a
P 51	c	a	a	c
P 52	d	a	d	a
P 53	c	b	b	d
P 54	b	d	c	d
P 55	c	c	a	a
P 56	c	d	d	c
P 57	d	a	d	d
P 58	b	a	a	c
P 59	b	a	a	c
P 60	a	d	c	b
P 61	a	b	c	c
P 62	b	a	b	a
P 63	a	a	c	d
P 64	b	d	b	b
P 65	a	c	b	c
P 66	d	a	d	a
P 67	a	b	d	c
P 68	a	b	b	c
P 69	c	b	a	d
P 70	d	a	a	a
P 71	b	b	a	c
P 72	b	b	d	a
P 73	d	d	b	d
P 74	b	c	c	d
P 75	a	a	a	a
P 76	b	c	d	c
P 77	c	a	d	d
P 78	a	a	d	c
P 79	a	a	d	d
P 80	c	a	b	a
P 81	c	c	c	a
P 82	b	b	c	b
P 83	a	a	d	d