

Exam questions: AE3-295-I

1. Describe the difference between the fifth and the sixth "freedom of the air".

Solution:

Fifth freedom: Traffic from a foreign country to another foreign country but it originates or ends in own country

Sixth freedom: Traffic from a foreign country to another foreign country via own country.

2. What three types of air freight carriers can be distinguished and what are the primary characteristics of these carriers. Mention an example airline (currently operational) for each type of air freight carrier.

Solution:

- **Combination carriers**→ Normal flights, contains both passengers and cargo, airport to airport service, e.g. KLM
- **All cargo airlines**→ flights that contains only cargo, airport to airport service e.g. Cargolux
- **Integrated carriers**→ they provide cargo services from door to door e.g. UPS, Fed ex

3. Most safety measures have a dual effect. Whether they are more or less directed at survivability or at prevention, they can be categorized into 5 groups. Name those 5 groups and give for each group 3 examples.

Solution:

Book, Page 27,28

4. Mention three Dutch companies that are involved in the manufacturing of engine components and who are members of the Dutch Aero Engine Cluster (DAEC).

Solution:

- NLR
- Dutch aero
- Sulzer Eldim

5. Quality Management as a safety measure has evolved significantly in recent years. Highlight the major differences between quality control in the past (quality inspection) and at present (quality assurance)?

Solution:

- Aircraft manual updated contains more restriction as a function of runway length and temperature.

6. What are the essential characteristics, advantages and disadvantages of (i) a hub-and-spoke network, and (ii) a point-to-point (grid) network?

Solution:

(i) Hub and Spoke Network:

Advantages:

- Increase in city pairs coverage
- Increase in traffic density
- Protection from competition

Disadvantages:

- Potential cost penalties
- High dependency on punctuality
- Unattractiveness (due to much time)

(ii) Point to point Network:

- Every point has direct connection with every other point less city pairs
- Minimum travelling time cost is usually high
- Difficult to fill the flight

7. What is the difference between Direct Operating Cost (DOC) and Indirect Operating Cost (IOC)? Mention 3 cost elements related to DOC and 3 cost elements related to IOC.

Solution:

Direct Operating Cost is the costs those are direct related to the flights

Indirect operating costs are ground costs to have a airline.

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8. What are the issues that were typically covered in a conventional (pre-1978) bilateral agreement?

Solution:

- Bilateral agreements → Traffic rights (Permission to serve the routes)
- Inter airlines agreements → Capacity (Aircraft size, Frequency)
- Tariff agreements under IATA → Fares (price for passengers and cargo)

9. What are the main characteristics of low-cost carriers as identified by Transavia?

Solution:

- Single type fleet + Standardization
- Low overhead costs (outsourcing)
- Sales via Internet and call centres
- Low yield, high volume concept
- Short haul, high frequency, quick turnaround, and high crew productivity
- In Flight Sales, E-business
- Simple and single type service on board and on the ground

10. What are the main aims of the Single Sky Initiative?

Solution:

- More efficient routes (direct routes)
- Flexibility in routes.
- Increase the capacity of airfield.

11. Many of the concepts and principles of airline economics apply equally to the cargo side of the air transport industry equally as to the passenger side. However, there are also certain aspects in which they are quite different. Mention at least four of these aspects.

Solution:

Cargo side is different than the passenger side because

- Most Cargo, except emergency freight is in different to routing, while most passengers prefer shortest route.
- The passengers airline usually sells the ticket directly to individual passengers, result high profit margin while cargo airlines usually deal with the wholesalers and freight consolidators that results very low profit.
- The all cargo flights doesn't required on board services.
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12. Despite the fact that the DOC per seat is relatively high for regional jets in comparison to regional turboprops and narrow body jets, regional jets are progressively deployed on U.S. route networks. Why is that?

Solution:

This is because the velocity and capacity of turboprops is low for such a long routes

13. What are the reasons that regional jets have a higher DOC per seat in comparison to narrow body jets?

Solution:

- The cost of regional jet is higher (one has to pay more interest).
- Pilot and Cabin crew
- High fuel consumption

14. Describe the difference between the seventh and the eight "freedom of the air".

Solution:

- *Seventh freedom: Traffic entirely from foreign country to another foreign country.*
- *Eighth freedom: Traffic with in a foreign country.*

15. What is the meaning of the following acronyms: (i) ICAO, (ii) IATA, (iii) FAA, (iv) JAA, (v) ECAC.

Solution:

- ICAO: International Civil Aviation Organisation
- IATA: International Air Transport Association
- FAA: Federal Aviation Administration
- JAA: Joint Airworthiness Authorities
- ECAC: European Civil Aviation Conference

16. In 1978 the Airline Deregulation Act was signed into law in the U.S. What was the impact of the liberalization of the air transport market on the charter airline industry in the U.S.?

Solution:

The limitations on charter industry were removed in that act and unlimited charter rights granted.

17. What are the governance principles that are employed at Transavia airlines?

Solution:

- Cyclic planning on three levels: Strategic, Tactical, Operational
- Tight and loose control (freedom within agreed limits)
- Control as closely as possible to the process (max delegation of authority)
- Reporting (Daily, monthly, quarterly and yearly)

18. In the nineteen sixties and seventies the average yearly productivity of the KLM fleet rose dramatically, but in the last decades the increase in productivity has tapered off. What is the definition of productivity?

Solution:

- The productivity is the efficiency of fleet.
- Increasing productivity through new technology enabled the airlines to develop new, price sensitive markets. This facilitated fast growth.

- Current technology does not offer the same rate of productivity increase.

19. In the last few decades the average yields have steadily eroded and also ticket prices continue to decline. At the same time, aircraft purchase prices are escalating. From what improvement areas do the cash-generating abilities of new aircraft types now have to come?

Solution:

Increase in cash-generating ability of new aircraft models has to come from other improvement areas:

- Lower operating cost: fuel burn, maintenance cost etc.
- Increased daily utilization of aircraft

20. What are the most important expected near-future developments in the charter market?

Solution:

21. Air Traffic Control plays an important role in making air transportation possible?

a) What are the legal tasks of ATC The Netherlands?

- air traffic control
- flight information service
- alerting service

b) The controlled airspace can be divided into three vertical areas (note than one of these areas is often further subdivided into “upper and “lower”). Name these areas and their associated acronyms.

- Control zone (CTR)
- Terminal Control Area (TMA)
- Control Area & Upper control Area (CTA & UTA)

c) Name the responsible sub-organization for each of these three areas.
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d) Which four regulations form the basis for the Single European Sky?

- service provision regulation
- airspace regulation
- interoperability regulation
- Framework regulation

e) What is the reason that the provision of air navigation services is much more cost effective in the U.S.A. in comparison to Europe?

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f) What are the most important issues covered by the regulations laying down the framework for the creation of the Single European Sky?

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22. Describe the noise regulations pertaining to Schiphol airport. How is the “actual“ noise load (as specified in the noise regulations applicable to Schiphol airport) determined?

Solution:

- Limits on cumulative noise load for one year:
 - “total volume” of noise
 - noise at “enforcement points”
 - separate sets of limits for 24 hours period (L_{den}) and night (L_{night})

- Limits based on scenario for airport operation meeting basic equivalence criteria (for example 12,300 houses within 58 dB (A) Lden contour)
- Noise load = $L_{den} = 10 * \log(\sum_i^N w * f_i * 10^{SEL/10}) - 75$
 N = Total number of aircraft movements per year
 $W * f_i$ = weighing factor
SEL = Sound Exposure Level

23. What are the present R&D (Research & Development) focus areas of the Stork Fokker AESP company?

Solution:

- R&D focus areas, aerostructures
- Low weight designs through innovative materials processing (glare, thermoplastics)

24. In the context of the Single European Sky initiative, the introduction of so-called FAB's is considered. What is a FAB? What is SESAR and what are the quantified 2020 targets for SESAR?

Solution:

FAB:

- airspace block based on operational requirements
- established regardless of State boundaries
- service provision performance driven and optimised
- enhanced cooperation among air navigation service providers
- where appropriate, an integrated provider

SESAR:

SESAR is Joint European ATM Program to identify ATM requirements for 2020 and a Master plan for implementation

25. The Dutch airline Transavia.com employs a hybrid business model. What is the meaning of the notion "hybrid" in this context? What are the implications of this hybrid business model for, aircraft type, crew type, service concept, branding and distribution?

Solution:

Hybrid mean Charter and Scheduled flights

All types are single, except two distribution channel.

26. What is the meaning of the acronym IATA? Historically, what has been the main function of this organization? What are IATA's main functions at present?

Solution:

IATA=International Air Transport Association

Historical Function: set airline fares and cargo rates

Present Function: operate the clearing house for the inter airline debts

27. What cost elements contribute to the cost advantage that a typical non-scheduled charter operator enjoys over a scheduled airline?

Solution:

Station Costs, passenger services, depreciation costs

28. The European charter industry is characterized by a strong tendency towards “vertical integration”. What is the meaning of the notion “vertical integration” in the context of the charter industry? Did vertical integration also take place in the U.S market? Explain.

Solution:

Vertical integration is the cooperation of tour operators and charter airlines, this is not possible in the US since the anti-trust regulations prevents it.

29. Describe the role of the national governments with respect to arranging airline tariffs in, (1) a conventional(pre-1978) bilateral agreement, (2) a 1978-91 “open market” bilateral agreement, (3) a post 1991 “open skies”bilateral.

Solution:

- governments maintained right to approve/disapprove tariffs proposed by airlines, where possible use procedures of IATA
- Country of origin rules for scheduled tariffs and double disapproval of both governments
- free pricing

30. Europe, the United States and Canada are currently discussing the creation of a “Transatlantic Common Aviation Area” (TCAA), to move beyond the present “open skies” agreements. What are the four key issues that need to be resolved before (potentially) an agreement on TCAA can be reached?

Solution:

- open market access within common aviation area
- nationality or ownership rules and the right of establishment
- competition policy
- regulations

31. In the context of a hub & spoke network system, what is a “trunk route”?

Solution:

The direct route between two hub airports

32. Lean Six Sigma drives the new business culture at KLM E&M. What are the key elements of the Lean Six Sigma management philosophy?

Solution:

33. Indicate the primary reasons why larger aircraft generally have a lower direct operating cost per seat-kilometer relative to smaller aircraft.

Solution:

The number of seats is larger while the flight equipment, airport charges and crew salary stays about the same

34. When KLM opened its new route to Nagoya, Japan, what were the main considerations in the network development?

- direct flight AMS-NGO, without traffic rights
- Circle flight AMS-NGO-SPK-AMS with fuel stop,without traffic rights
- Circle flight AMS-NGO-SPK-AMS with traffic rights
- AMS-SPK-NGO with traffic rights

35. What is the issue that the JAR-145 (or EASA PART-145) standard addresses? What is the meaning of the acronyms JAR and EASA?

Solution:

JAR=Joint Airworthiness Requirement

EASA=European Aviation Safety Agency

No aircraft used for commercial air transport may fly unless the certificate of release to service has been issued by an organization of maintenance.

36. When considering an airline's economic performance, what is the difference between yield and net margin?

Solution:

Yield is the average revenue collected per passenger kilometer or ton kilometer of freight carried. Passenger yield is calculated by dividing the total passenger revenue on a flight by the passenger kilometers generated by that flight. It is a measure of the weighted average fare paid.

While net margin is a profit generated after the deduction of all costs.

37. What are the names of the three largest global airline alliances? For each global alliance, mention three member airlines.

Solution:

- Sky-Team (Airfrance-KLM,Northwest, Alitalia)
- OneWorld (Qantas, Iberia, American Airlines)
- StarAlliance (Lufthansa, United Airlines, Singapore Airlines)

38. Describe the concept of (cost) escapability. Explain the meaning of fixed (or standing) costs and variable (or flying) costs in the context of escapability.

Solution:

Different costs will require different periods of time before they can be avoided, but in the end all costs are escapable.

Fixed costs=costs which are directly escapable in the short run

Variable costs=costs which are not escapable in the short run

39. An aircraft's operational performance can be characterized by three diagrams, viz., the payload-range diagram, the productivity diagram and the cost relationship diagram. Draw those three diagrams, explain them briefly and draw them in such a way that the relationship between the three diagrams is clear!

Solution:

See flying off course, page 123

40. What are the present R&D (Research & Development) focus areas of the Stork Fokker AESP company?

Solution:

- composites
- high performance machining
- assembly
- GLARE

41. Describe the difference between the first and the second "freedom of the air".

Solution:

1st=fly over a foreign country without landing

2nd=land in a foreign country for technical reasons