



**Theoretical Examination to Obtain or Renew License Weight
and Balance Operator in English**

(Last Updated: December 2014)

Subject : WEIGHT AND BALANCE OPERATOR IN ENGLISH
Number of Questions : 50

- 1.- The difference between a MRW (Maximum ramp weight) and a MTOW (Maximum take off weight) corresponds to:**
 - A.- The weight of the crewmembers and their baggage.
 - B.- Maximum fuel burnt during the take off.
 - C.- Fuel available for use during taxiing.

- 2.- Document titled “Technical Instructions for the Safe Transport of Dangerous Goods by Air” and its supplement, corresponds to:**
 - A.- DAR-18.
 - B.- OACI 9284-AN/905.
 - C.- DAR-06.

- 3.- DAR-06 is the regulation on:**
 - A.- The safe transport of dangerous goods by air.
 - B.- Aeronautical Violations Procedures.
 - C.- Operation of Aircraft.

- 4.- **At low take off speeds and being the CG in too forward position:**
- A.- The elevator will produce enough authority to lift the nose of the airplane.
 - B.- The elevator might not produce enough nose up for rotation.
 - C.- The elevator would be very sensitive and would produce an excessive nose up for rotation.
- 5.- **Privileges of the Weight and Balance Operator are:**
- A.- To provide services at operational units for dispatch, reception and route control.
 - B.- To direct load and unload works and make aircraft CG calculations.
 - C.- None of the above.
- 6.- **Zero Fuel Weight (Z.F.W.) is:**
- A.- An operational limitation.
 - B.- A structural limitation.
 - C.- A limitation defined by the Operator.
 - D.- Not a limitation.
- 7.- **The reference line from which all arm measurements are made is established by the manufacturer and is called:**
- A.- Center of gravity.
 - B.- Arm.
 - C.- Moment.
 - D.- Datum.
- 8.- **Inspection and approval of the weight and balance of an aircraft to insure that it complies with technical specifications is the responsibility of:**
- A.- The air carrier.
 - B.- The weight and balance operator.
 - C.- The aircraft captain.
 - D.- The first officer.

- 9.- **Maximum Zero Fuel Weight (MZFW):** a) The maximum weight authorized for the airplane without including fuel (Empty Operational weight plus Payload). b) Varies according to weather conditions at each airport. c) Is a fixed value established by the manufacturer.
- A.- Only A is correct.
 - B.- Only C is correct.
 - C.- A and B are correct.
 - D.- A and C are correct.
- 10.- **Payload is the weight of:**
- A.- Passengers and cargo.
 - B.- Passengers and baggage.
 - C.- Only cargo.
 - D.- Passengers, baggage and cargo.
- 11.- **With regard to flight safety we may say that:**
- A.- It is not affected by a too far forward CG.
 - B.- It is not affected by a too far aft CG.
 - C.- It is not affected by a too far forward or a too far aft CG.
 - D.- The CG must be within forward and aft limits.
- 12.- **It includes all operational equipment that have a fixed position and is currently installed in the airplane and consists in the airframe, installed equipment, fluids in the lines and unusable fuel:**
- A.- Maximum weight.
 - B.- Empty weight.
 - C.- Payload.
 - D.- None of the above.
- 13.- **A requirement for renewing a Weight and Balance operator License is:**
- A.- To have performed appropriate functions during at least 24 months in the last 4 years.
 - B.- To have made a retraining or refreshment ground course accepted by the DGAC.
 - C.- A and B are correct.

- 14.- **The moment equation is defined as:**
- A.- $M = P \times B$
 - B.- $M = P \times V$
 - C.- $M = P \times T$
 - D.- $M = T \times B$
- 15.- **Some of the problems caused by overloading an airplane are: a) A longer landing run because the landing speed is lower. b) A longer landing run because the landing speed is higher. c) The airplane will need a higher take off speed, which will result in a longer take off run. d) The airplane will need a higher take off speed, which will result in a shorter take off run.**
- A.- A and C are correct.
 - B.- A and D are correct.
 - C.- B and C are correct.
 - D.- B and D are correct.
- 16.- **How is Zero Fuel Weight (Z.F.W) obtained?**
- A.- OW (Operational Weight + Payload).
 - B.- EW (Empty Weight) + Payload.
 - C.- TOW (Take off weight) - MFO (Minimum fuel on board).
 - D.- LW (Landing Weight) - MFO (Minimum fuel on board).
- 17.- **What does M.Z.F.W mean?**
- A.- Weight of the airplane with full fuel.
 - B.- Maximum zero fuel weight.
 - C.- Weight of airplane fuel.
 - D.- Weight of the fuel in the fuselage tanks
- 18.- **The requirements of the Directorate General of Civil Aeronautics of Chile for the issuance of a Weight and Balance License are published in:**
- A.- DAN-91.
 - B.- DAR-01.
 - C.- DAR-08.

- 19.- **One of the more serious problems caused by a too far forward CG (CG towards the nose of the airplane) is the lack of authority of the elevator.**
A.- True.
B.- False.
- 20.- **Which is correct with regard to weight and balance of an aircraft:**
A.- CG limits for each specific flight. are established by the pilot or the flight operations officer/flight dispatcher.
B.- Loading and aircraft with an aft cg, out of established limits is the one that has the most adverse effects, especially on its longitudinal stability and on its capability to recover from a stall.
- 21.- **The point where all the weights of an aircraft concentrate is called:**
A.- Aerodynamic center.
B.- Center of pressure.
C.- Center of gravity.
D.- Weight.
- 22.- **The Basic Operational Weight (B.O.W.), includes the airplane empty weight plus the fuel weight:**
A.- True.
B.- False.
- 23.- **DAR-51 “Reglamento de Sanción por Infracciones a la Legislación y Disposiciones Aeronáutica” is applicable to:**
A.- Ground personnel holding an aeronautical license.
B.- Flight personnel holding an aeronautical license.
C.- A and B are correct.
- 24.- **The issuing of licenses required by regulations to aeronautical personnel is the responsibility of:**
A.- The companies.
B.- The aircraft operator.
C.- The Directorate General of Civil aeronautics.

- 25.- The difference between the Take off Weight or Ramp Weight, if applicable, and the Empty Basic Weight of the aircraft is the:**
- A.- Payload.
 - B.- Useful load.
 - C.- Fuel on board the airplane.
 - D.- None of the above.
- 26.- To be issued a Weight and Balance Operator License an applicant is required to have a current medical certificate:**
- A.- Class 2.
 - B.- Class 3.
 - C.- General
- 27.- By which of the following methods it is possible to determine the Center of Gravity (C.G.) of an airplane?**
- A.- Dividing the total arm by the total moment.
 - B.- Multiplying the total weight by the total moment.
 - C.- Dividing the total moment by the total weight.
 - D.- Multiplying the total arm by the total weight.
 - E.- All the above are correct.
- 28.- The improper distribution of the load may affect flight safety due to:**
- A.- If the cg does not remain within permissible limits, stability is adversely affected.
 - B.- Stall speed and take off run increase dangerously.
 - C.- Landing speed may be affected dangerously
 - D.- All above answers are correct.
- 29.- For weight and balance purposes, fuel load is:**
- A.- Usable fuel plus unusable fuel remaining in fuel tanks and lines.
 - B.- Only usable fuel.
 - C.- Usable fuel plus a quantity established for each aircraft as unusable fuel.

30.- “The person who transports or who directs other person to transport objects that are dangerous for the safety of the aircraft, without complying with law or regulations provisions will be penalized with imprisonment in its medium or maximum degrees or a fine equivalent to between thirty to two hundred minimum monthly wages. The same penalty shall be applied to the person who orders to initiate the flight and the person who pilots an aircraft with excess weight or a bad distribution of the load”:

A.- Código Aeronáutico.

B.- Dar-51.

C.- Dan-91.

31.- Standard Empty Weight of an aircraft is defined as:

A.- The weight of the airframe, powerplants, permanently installed equipment, full oil quantity and full fuel quantity.

B.- The weight of the airframe, powerplants, permanently installed equipment, non-drainable fuel and full quantity of oil.

C.- The weight of the airframe, powerplants, permanently installed equipment, pilots, passengers and baggage.

D.- The weight of the airframe, powerplants, permanently installed equipment and fuel.

32.- The information on weight and balance of an aircraft establishes that the MAC is from stations 144 to 206 and the CG is located at station 161. Determine: $CG \text{ in } \% \text{ MAC} = (\text{Distance aft of the LEMAC} \times 100) / \text{MAC}$

A.- 74.19%

B.- 37.78%

C.- 27.4%

D.- 20.5%

33.- The datum line used in weight and balance calculations may be located:

A.- In the airplane nose.

B.- In the wing leading edge.

C.- Forward of the airplane nose.

D.- All the above are correct.

- 34.- The product of the weight of an item multiplied by its arm is called:**
A.- Datum.
B.- Arm.
C.- Moment.
D.- Index.
- 35.- An aircraft empty basic weight includes:**
A.- Airframe, powerplants and permanently installed equipment.
B.- The above plus hydraulic liquid, oil and undrainable fuel (residual).
C.- Items indicated in A and B above, excluding hydraulic liquid.
- 36.- When the C.G is in the aft limit of the range, the aircraft will have a nose up condition, which affects negatively the cruising speed, and if these conditions are reduced considerably up to the point of stalling it is highly probable that the aircraft is unable to perform a successful recovery due to the fact that the elevator might not be effective.**
A.- True.
B.- False.
- 37.- Fuel consumption in flight, including, sweptback wing airplanes, does not affect the CG position.**
A.- True.
B.- False.
- 38.- The Empty Operational Weight:**
A.- Is the airplane Empty Weight plus fuel.
B.- Is the airplane Empty Weight plus the Standard Empty Weight .
C.- Is the Standard Empty Weight plus fuel.
D.- Is the Basic Empty weight of the airplane plus the weight of the crew, their baggage and other standard items such as food and drinkable water.
- 39.- The Weight and Balance Operator license is renewed every:**
A.- 12 months.
B.- 2 years.
C.- 4 years.

- 40.- The Mean Aerodynamic Chord (M.A.C.) is used for determining:**
- A.- Vertical measurements of weights.
 - B.- Horizontal measurements of any item put on the airplane.
 - C.- The center of gravity position
 - D.- The center of pressure position.
- 41.- The Datum is an imaginary line from which arms are measured for the purpose of balancing an aircraft. The position of the Datum for each aircraft is determined by the:**
- A.- Aircraft manufacturer.
 - B.- Each operator.
 - C.- The pilot, or the Flight Operations Officer (or dispatcher) at the moment of making the weight and balance calculations.
- 42.- Unbalance of fuel in sweptback wing airplanes is very critical because first burnt fuel is usually that of the outboard tanks making the CG to move aft and if inboard tanks fuel is consumed the CG would move forward.**
- A.- True.
 - B.- False.
- 43.- DAR-18 corresponds to:**
- A.- Regulations on the Safe Transport of Dangerous Goods by Air.
 - B.- Regulations on aviation rules violation procedures.
 - C.- Regulations on Operations of Aircraft.
- 44.- Overweight reduces flight performance of an airplane in almost every aspect, some deficiencies of an overloaded airplane are, but not limited to, the following:**
- A.- Greater length of runway for take off.
 - B.- Lower fuel consumption in cruise flight
 - C.- Less flight time.
 - D.- Lower payload.

- 45.- DAR-51 corresponds to:**
- A.- Regulations on the Safe Transport of dangerous goods by air.
 - B.- Regulations on Aviation Rules Violation procedures.
 - C.- Regulations on Operations of Aircraft.
- 46.- The datum is defined as:**
- A.- The imaginary horizontal line that defines the distance at which the c.g. is located.
 - B.- The imaginary vertical line from which arm measurements for calculation of moments are taken.
 - C.- Straight line that connects the leading edge with the trailing edge for the calculation of moments.
 - D.- Imaginary vertical line located by the pilot for arm measurements for the calculation of moments.
- 47.- Some of the problems caused by overloading an airplane are: a) Cruise speed will decrease. b) Service ceiling will be lower. c) Maneuverability will be reduced. d) Rate and angle of ascent will be reduced.**
- A.- A and C are correct.
 - B.- A, B and D are correct.
 - C.- A, C and D are correct.
 - D.- All alternatives are correct.
- 48.- The Maximum Take Off Weight (MTOW) is:**
- A.- Minimum weight permissible on the ramp.
 - B.- Maximum weight permissible to start taxiing.
 - C.- Maximum weight permissible to start the take off.
 - D.- Maximum weight permissible for landing.
 - E.- All are correct.

49.- The Maximum Weight approved on the ramp minus weight of fuel burnt during engine start and ground operations before take off equals:

- A.- Maximum Take off Weight.
- B.- Ramp Maximum Weight.
- C.- Zero Fuel Maximum Weight.
- D.- Payload Weight.

50.- Marshalling signals to be used by a signalman are published in:

- A.- DAR-01.
- B.- DAN-91.
- C.- DAR-06.