

Revision C104

1. explain the difference between stability and controllability?

stability : tends to cause it to fly (hand off) in straight and level flight path (without pilot)

controllability : quality of response of aircraft to the pilot command while maneuvering aircraft

2. how do you differentiate positive, neutral and negative stability?

positive : initial tendency of aircraft to return to original state of equilibrium after being disturbed

neutral : initial tendency of aircraft to remain in new condition after its equilibrium has been disturbed.

negative : initial tendency of aircraft to continue away from original state of equilibrium after being disturbed

3. how do static stability differ from dynamic stability?

static stability : initial tendency or direction movement, back to equilibrium, initial response

When disturbed from given Alt, slip, or bank
dynamic stability?

refer to the aircraft response over time when disturbed from given Alt, slip or bank.

4. What is the role of primary control surface of an aircraft?

1. Aileron 2. elevator 3. rudder

5. What is meant by longitudinal stability?

* is the quality that makes aircraft stable about its lateral axis.

* maintains straight flight path

6. What factors influence static longitudinal stability?

1. location of wing with respect to CG

2. location of horizontal tail surface with respect to CG.

3. Area or size of tail surface

7. How does center of CL change with Alt?

when the CL moves forward, AOA $\uparrow$.

while when CL moves aft, AOA $\downarrow$.

8. What is the dihedral and how does it contribute to lateral stability?

• dihedral is the wing on either side of aircraft join fuselage to form slight V or angle.

• upward angle of wing relative to horizontal plane

9. How does sweepback enhance aircraft stability?

• Increased Lift: The low wing gains more L when it is at $\downarrow$ angle to the airflow.

• helps increase lift when wing drop

10. What is Roll affect?

1. is important for maintaining lateral stability.

2. refer to aircraft natural tendency to align its longitudinal axis with the relative wind.

11. What is meant by directional stability

1. Stability about aircraft vertical axis (Side moment) is called yawing or directional stability

12. What are the main factor affecting lateral stability?

There are four factor that make aircraft lateral stability are dihedral, sweepback, keel effect and weight distribution.

13. How does vertical fin assist aircraft stability?

by acting like a feather on arrow enhancing stability.

14. How would differentiate Active stability of aircraft from passive stability?

Active stability: use artificial stabilizing system to improve the handling of vehicle which do not exhibit sufficient passive stability

passive stability: vehicle is naturally inherently stable and do not use artificial stabilizing
* require both static and dynamic stability
15. why maneuverability is important

for aircraft?

because, it is make the aircraft to permit maneuver easily and to withstand the stress imposed by maneuver.

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16. what happens to an aircraft with longitudinal instability?

* it is difficult and sometimes is dangerous to fly.

* has tendency to dive or climb progressively into very steep dive or climb or even stall.

17. How do Wing and Tail movement influence aircraft stability?

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