

Technical general- test 02

1. During a correctly balanced turn:
 - a. The thrust is the component of the centrifugal force
 - b. The centrifugal force directly balances the weight of the aircraft
 - c. The lift force provides a centripetal force and a force that opposes the weight of the aircraft**

2. In a steady unaccelerated descent:
 - a. Thrust is greater than the drag
 - b. Thrust is less than the drag and lift is less than the weight**
 - c. Thrust is equal to drag and lift equal to the weight

3. Which of the following forces enables to make the aircraft turn level?
 - a. Weight
 - b. Lift**
 - c. Thrust

4. "Tuck under " is:
 - a. The tendency to nose up when speed is increased into the transonic flight regime
 - b. The tendency to nose down when speed is increased into the transonic flight regime**
 - c. The tendency to nose down when control column is pulled back

5. A Machtrimmer :
 - a. Increase stick force per g at high mach numbers
 - b. Corrects insufficient stick force stability at high mach numbers**

- c. Is necessary for compensation of the autopilot at high mach numbers
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- 6. After a disturbance about the lateral axis, an aeroplane oscillates about the lateral axis at constant amplitude, the aeroplane is:
 - a. Statically unstable, dynamically neutral
 - b. Statically stable, dynamically unstable
 - c. **Statically stable, dynamically neutral**

 - 7. A light twin in a turn at 20° bank and 150 kts TAS. A more heavy aeroplane at same bank angle and same speed will:
 - a. **Turn at the same radius**
 - b. Turn at bigger radius
 - c. Turn at smaller radius

 - 8. The effect of the headwind is to ----- the climb gradient and to ----- the rate of climb
 - a. **Increase, No affect**
 - b. Decrease, decrease
 - c. Decrease, increase

 - 9. Adverse aileron yaw can be counteracted by:
 - a. Aileron reversal

b. Differential ailerons

c. Aileron snatch

10. An advantage of locating the engines at the rear of the fuselage, in comparison to a location beneath the wing, is:

a. Less influence on longitudinal control of thrust changes

b. A wing which is less sensitive to flutter

c. Lighter wing construction

11. An aeroplane has a servo tab controlled elevator. what will happen when only the elevator jams during flight?

a. The servo tab now works as negative trim tab

b. The pitch control force doubles

c. Pitch control reverses direction

12. The theoretical best range speed for jet aircraft is:

a. Minimum drag speed

b. Minimum power speed

c. 1.32 times the minimum drag speed

13. The greatest gliding range would be obtained from a wing at:

a. At high AoA and max L/D ratio

b. Small AoA and best L/D ratio

c. Small AoA and Minimum L/D ratio

14. In a steady un accelerated glide:

- a. Resultant aerodynamic force is equal to drag
- b. Resultant aerodynamic force is equal to weight**
- c. Resultant aerodynamic force is equal to lift

15. When an aircraft is in a climb at constant indicated airspeed:

- a. Thrust is equal to the weight acting along the flight path
- b. Thrust is less than the drag
- c. The aerodynamic drag component is less than the thrust**

16. In a level turn:

- a. Lift equals the weight
- b. The component of the lift in the vertical direction equals the weight**
- c. The component of the lift in the horizontal direction equals the weight

17. A control surface has its limitation in movement by:

- a. Control cable tension
- b. Primary stop at the control column
- c. Primary stop at the control surface**

18. A horn balance in a control system has the following purpose

- a. To prevent flutter
- b. To decrease stick force**
- c. To decrease longitudinal dihedral

19. A jet aeroplane equipped with inboard and outboard ailerons is cruising at normal mach no, in this case:

- a. **Only inboard ailerons are active**
- b. Only outboard ailerons are active
- c. Only spoilers will be active, not the ailerons

20. The speed for maximum sink rate in a glide, compared to speed for maximum distance V_{md} is:

- a. Equal to V_{md}
- b. **Slower than V_{md}**
- c. Faster than V_{md}

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24. An aircraft is placed in a level balanced turn and control released. It is spirally instable if:

- a. The bank reduces
- b. Bank increases**
- c. Pitch attitude increases

25. At constant EAS, the effect on aerodynamic damping as height increases?

- a. Damping in pitch is reduced
- b. Damping in all axis increases
- c. Damping in all axis reduced**

26. Deflecting elevator up, when the trim tab is in neutral, will cause the tab to:

- a. Move up relative to the elevator chord line
- b. Move down relative to the elevator chord line
- c. Remain in line with elevator**

27. An aircraft approaching to land with its CG at the forward limit. It will be----to flare and VREF will be ---- than normal

- a. Difficult, higher**
- b. Easy, lower
- c. Difficult, lower

28. An aircraft tendency to dutch roll may be reduced by:

- a. Giving a wing anhedral**
- b. Reducing the size of fin
- c. Sweeping the wings

29. An example of differential aileron deflection during initiation of left turn is:

- a. **Left aileron 5° up, right aileron 2°down**
- b. Left aileron 2° up, right aileron 5° down
- c. Left aileron 2°up, right aileron 5°up

30. Control surface overbalancing may be result of:

- a. **The control surface CP being located in front of the surface hinge line**
- b. A sudden movement of the CP aft of the surface hinge line
- c. Applying excessive force to the controls

31. Differential aileron deflection:

- a. Increases the CLMax
- b. Is required to keep the total lift constant when ailerons are deflected
- c. **Equals the drag of the right and left aileron**

32. During the initiation of a turn with speedsbrakes extended, the roll spoiler function induces a spoiler deflection:

- a. On the up going wing only
- b. On the downgoing wing only
- c. **Downward on the upgoing and upward on the downgoing wing**

33. A propeller blade is twisted in order to:

- a. **Keep the local angle of attack constant along the blade**
- b. Allow higher mechanical stress

- c. Avoid local transonic flow to develop on the propeller blades

34. A propeller turning to the right, seen from behind. The asymmetric thrust effect in climb will:

- a. Roll to right
- b. Yaw to left**
- c. Yaw to right

35. A propeller mounted forward of the engine is termed as:

- a. A paddle propeller
- b. A tractor propeller**
- c. A pusher propeller

36. A propeller turns to right, seen from behind. The torque effect in take off will:

- a. Roll the aeroplane to the left**
- b. Pitch the aeroplane nose up
- c. Roll the aeroplane to the right

37. A twin engine aircraft is available in both jet and propeller variants. The engines are mounted on the wings in same position on both types. In case of failure of one engine, how would the engine torque effect show itself?

- a. Jet roll toward live, propeller toward live
- b. Jet roll toward dead, propeller roll toward dead
- c. Jet no change, propeller roll in the direction of dead engine**

38. A variable pitch propeller during take off will move towards:

- a. Coarse pitch to achieve highest possible thrust
- b. Fine pitch to ensure engine can develop maximum power**
- c. Fine pitch to ensure minimum aerodynamic drag is generated

39. An engine failure can result in a (1) wind milling propeller, (2) non rotating propeller. Which statement about propeller drag is correct?

- a. 1 is larger than 2**
- b. 2 is larger than 1
- c. 1 is equal to 2

40. Asymmetric propeller blade effect is mainly induced by:

- a. The inclination of the propeller axis to the relative airflow**
- b. Large angles of climb
- c. High speed

41. A commercial jet aeroplane is performing a straight descent at a constant mach no with constant weight. The operational limit that may be exceeded is:

- a. VNE
- b. VMO**
- c. VD

42. Constant speed propeller provide better performance than fixed pitch propeller because they:

- a. Produce an almost maximum efficiency over a wider speed range**

- b. Have more blade surface area than a fixed pitch propeller
- c. Produce greater maximum thrust than a fixed pitch propeller

43. Flutter may be caused by

- a. High speed aerodynamic wing stall
- b. Distortion by bending and torsion of the structure causing increasing vibration in the resonance frequency**
- c. Roll control reversal

44. Counter rotating propellers have the effect of

- a. increasing torque but decreasing the gyroscopic effect
- b. increasing torque and gyroscopic effect
- c. cancelling out the torque and gyroscopic effect**

45. Does the pitch angle of constant speed propeller alter in medium horizontal turbulence?

- a. Yes
- b. No
- c. Yes, slightly**

46. With a swept wing aircraft, with an increase in altitude, which of the following statements about lateral stability is correct?

- a. Static lateral stability remains the same, dynamic lateral stability decreases**
- b. Static lateral stability decrease, dynamic lateral stability increase
- c. Static lateral stability increases, dynamic lateral stability increase

47. Aileron reversal can be caused by:

- a. Fries type aileron at low AoA

b. Twisting of wing above reversal speed

c. Both A and B

48. Which statement is correct for a sideslip condition at constant speed and side slip angle, where geometric dihedral of an aeroplane is increased?

a. The required lateral control force increases

b. The required lateral control force decreases

c. The required lateral control force does not change

49. A jet transport aeroplane is in a straight climb at a constant IAS and weight. The operational limit that may be exceeded is:

a. VMD

b. MMO

c. VMO

50. Flutter can be eliminated using:

a. T tail

b. Powered flying controls

c. Mass balancing

51. For airplane with high wing loading

a. Vertical gusts may have less influence on the load factor

b. Vertical gusts may have more influence on the load factor

c. Total drag is mainly profile drag

52. For an aeroplane one fixed value of V_A the following applies, V_A is

- a. The speed at which unrestricted application of elevator can be used, without exceeding the maximum manoeuvring limit load factor
- b. The speed at which aeroplane stalls at manoeuvring limit load factor at MTOW**
- c. Just another symbol for rough air speed

53. The extreme right limitation for both V-n (gust and maneuver) diagram is created by the speed:

- a. V_C
- b. V_D**
- c. V_{MO}

54. The positive limit load factor for a transport jet with flaps extended is:

- a. 2.5
- b. 2.0**
- c. 1.5

55. The shape of gust load diagram is also determined by the following three vertical speeds ft/s (clean configuration)

- a. 25,55.75
- b. 25.50.66**
- c. 35.55.66

56. What can happen to aeroplane structure flying at speed exceed V_A

- a. **It may break the elevator if it is fully deflected upwards**
- b. Permanent deformation
- c. It may cause damage if a turn is executed

57. What is the danger when recovering from the emergency descent?

- a. Engine stall
- b. **Structural damage**
- c. Directional stability

58. What wing is less sensitive to turbulence

- a. **Swept**
- b. Straight
- c. Winglets

59. Which of the following lists aeroplane features that each increases static lateral stability?

- a. Fuselage mounted engines, dihedral, T tail
- b. **High wing, sweepback, large and high vertical fin**
- c. Low wing, dihedral, elliptical wing planform

60. Which has the effect of increasing the load factor?

- a. Rearward CG location
- b. Increased aeroplane mass
- c. **Vertical gusts**

61. A normal shock wave:

- a. is a discontinuity plane where temperature decreases
- b. is a discontinuity plane which is always normal to surface

c. **develops anytime an aircraft is in the transonic range**

62. A shock stall occurs when laminar flow breaks down:

- a. at a high angle of attack and high Mach number
- b. behind the leading edge
- c. **behind the shock wave**

63. At what speed does a shock wave move forward over the ground?

- a. aircraft's TAS
- b. speed of sound at ground level
- c. **aircraft's ground speed**

64. Compared to an oblique shock wave at the same Mach number, a normal shock wave has:

- a. **higher compression**
- b. lower compression
- c. lower expansion

65. Critical Mach number is:

- a. **the highest speed at which no parts of the aircraft are supersonic**
- b. the highest speed at which the aircraft is certified to fly (MMO)
- c. the highest speed at which all parts of the aircraft are subsonic ($< M 1.0$)

66. How does an aircraft with swept wings behave due to shock stall?

- a. **a nose up pitching moment will be generated**
- b. a swept wing is not significantly affected by shock stall
- c. a nose down pitching moment will be generated

67. How does the density and temperature of the airflow vary as it passes through a shock wave?
- a. **Density increases temperature increases**
 - b. Density decreases temperature decreases
 - c. Density decreases temperature increases
68. If it is required to increase the buffet margin from 0.3 g to 0.4 g which would be the correct action?
- a. Flaps increment increased
 - b. Higher altitude at same Mach number
 - c. **Lower altitude at same Mach number**
69. If Mach trim is unserviceable you should:
- a. fly at a constant speed
 - b. **limit the Mach number at which you fly**
 - c. limit the Mach number at which you fly
70. In transonic flight the increase in drag is due to:
- a. the increase in angle of attack
 - b. the increase in parasite drag
 - c. **the shock wave**
71. Increasing speed above M CRIT in a swept wing aircraft could cause:
- a. increased lift requiring high speed tuck
 - b. buffeting and nose-up pitch
 - c. **buffeting and nose down pitch**
72. structural failure of the wing due to shockwave formation Is it acceptable for a transport aircraft to exceed the Mach buffet onset speed?
- a. Yes to fly at maximum speed
 - b. **No totally unacceptable**
 - c. Yes flying very high Mach number and very high altitude
 - d. Yes during approach

73. Maximum cruise altitude is limited by minimum load factor. If that altitude is exceeded:

- a. Mach buffet will occur immediately
- b. turbulence may induce Mach buffet**
- c. turbulence may exceed load factor

74. Position/movement of the AC on straight wing aircraft when accelerating from subsonic to supersonic flight?

- a. Continues to move aft from the 25% chord position
- b. Moves forward from the 25% chord to the leading edge
- c. Moves aft from the 25% chord position to the 50% chord position**

75. A jet aircraft is in a level turn the pilot would have to increase:

- a. thrust and leave angle of attack constant
- b. angle of attack and thrust**
- c. thrust and decrease angle of attack
- d. angle of attack and leave thrust constant

76. A light twin is flying at 150 kt TAS in a 20 degree bank; a heavier aircraft is flying at same speed and angle of bank what will be the turn radius of the heavier aircraft?

- a. Smaller than the light aircraft
- b. Greater than the light aircraft
- c. the same as the light aircraft**

77. what other factors affect the glide range?

- a. CL MAX
- b. Lift/drag ratio**
- c. Weight and power required

78. For an aircraft at a given altitude what is the relationship between the TAS for minimum sink rate and for minimum glide angle?

- a. $V_{\min \text{ sink rate}} = V_{\min \text{ glide angle}}$
- b. $V_{\min \text{ sink rate}} < V_{\min \text{ glide angle}}$ or $V_{\min \text{ sink rate}} > V_{\min \text{ glide angle}}$ depending on type of aircraft
- c. $V_{\min \text{ sink rate}} < V_{\min \text{ glide angle}}$**

79. How does VMCG change with increasing field elevation and temperature?

- a. It increases because with decreasing density you need a higher IAS to generate the same rudder force.
- b. It increases because VMCG is related to V1 and VR and these speeds increase with decreasing density.
- c. **It decreases because engine thrust decreases**

80. The effect of positive wing sweep on static directional stability is as follows:

- a. No effect
- b. **Stabilizing effect**
- c. Negative dihedral effect

81. The effect of vertical fin on the static stability of an aeroplane is as follows:

(1=longitudinal, 2=lateral. 3= directional)

- a. No effect, positive, negative
- b. **No effect, negative, positive**
- c. Positive, negative, negative

82. The max aft position of the CG is amongst others limited by the :

- a. Maximum elevator deflection
- b. **Minimum value of stick force per g**
- c. Maximum longitudinal stability of the aeroplane

83. What will increase the sensitivity of a dutch roll

- a. **An increased static lateral stability**
- b. An increased static directional stability
- c. An increased anhedral

84. Propeller blade angle of attack is the angle between the chord and the:
- a. direction of axis of the propeller
 - b. aeroplane heading
 - c. vector of True Air Speed
 - d. **relative airflow**
85. Propeller efficiency is best described as:
- a. Brake HP to maximum power
 - b. **Thrust HP to shaft HP**
 - c. Thrust HP to overall power
86. The advantage of a constant speed propeller over a fixed pitch propeller is:
- a. **nearly maximum efficiency over wide speed range**
 - b. higher maximum thrust available
 - c. higher maximum efficiency
87. The angle of attack of a fixed pitch propeller designed for cruising flight measured at its reference station is:
- a. increases with an increase in TAS
 - b. decreases with an increase in RPM
 - c. **optimum in steady cruising flight only**
88. What is the disadvantage of increasing the number of propeller blades?
- a. decreased power absorption
 - b. increased noise
 - c. **decreased efficiency**
 - d. increased vibration
89. What is the purpose of increasing the number of propeller blades?
- a. Enable a longer undercarriage to be used
 - b. Increase the efficiency of the variable pitch mechanism
 - c. **Increase the power absorption**
 - d. Noise reduction
90. When an aircraft with a fixed pitch propeller climbs, the angle of attack of the propeller:
- a. reduces to zero
 - b. remain the same
 - c. **Gets smaller**

91. In which situation the wing lift of an aeroplane in straight and level flight have the highest value

- a. Aft CG and take off thrust
- b. Forward CG and idle thrust**
- c. Aft CG and idle thrust

92. A swept wing for given AoA and wing area:

- a. Increases lateral stability with reduced tip stall tendency
- b. More laterally stable and produce less lift**
- c. Produce more lift and more laterally stable

93. Longitudinal static stability is created by the fact that the:

- a. Wing surface is the greater than horizontal tail surface
- b. CG is located in the front of the neutral point of aeroplane**
- c. Aeroplane possesses a large trim speed range

94. What wing design features will help increase MCRIT?

- a. Negative camber sweepback
- b. Dihedral thin aerofoil
- c. Sweep back thin aerofoil**

95. When airflow becomes supersonic the pressure distribution on the top surface of the wing will become:

- a. triangular
- b. the same as subsonic
- c. rectangular**

96. When an aircraft is flying at supersonic speed where will be the area of influence of any pressure disturbance due to the presence of the aircraft be located?

- a. In front of the normal shock wave

- b. In front of the mach cone
- c. **Within the mach cone**

97. If the sum of all the moment s in flight is not zero about one of the axis, an aeroplane will:

- a. Would fly a path with a constant curvature
- b. **Would experience an angular acceleration about that axis**
- c. Would be difficult to control

98. In a twin jet powered aeroplane where engines are mounted below the wings, the thrust is suddenly increased. Which elevator deflection is required to maintain the pitching moment to zero:

- a. Up
- b. **Down**
- c. None

99. Superstall is a condition:

- a. Where aircraft is in a spin
- b. **Stable stall with almost constant pitch attitude**
- c. Where wings have stall at high speed

100. When the control column is moved forward and to the right:

- a. The elevator goes up, right aileron moves up and left aileron goes down
- b. **The elevator goes down, right aileron moves up and left aileron goes down**

- c. The elevator goes down, right aileron moves down and left aileron goes up