Technical general- test 02

1. During a correctly balanced turn:
   1. The thrust is the component of the centrifugal force
   2. The centrifugal force directly balances the weight of the aircraft
   3. **The lift force provides a centripetal force and a force that opposes the weight of the aircraft**
2. In a steady unaccelerated descent:
   1. Thrust is greater than the drag
   2. **Thrust is less than the drag and lift is less than the weight**
   3. Thrust is equal to drag and lift equal to the weight
3. Which of the following forces enables to make the aircraft turn level?
   1. Weigh.t
   2. **Lift**
   3. Thrust
4. “Tuck under “ is:
   1. The tendency to nose up when speed is increased into the transonic flight regime
   2. **The tendency to nose down when speed is increased into the transonic flight regime**
   3. The tendency to nose down when control column is pulled back
5. A Machtrimmer :
   1. Increase stick force per g at high mach numbers
   2. **Corrects insufficient stick force stability at high mach numbers**
   3. Is necessary for compensation of the autopilot at high mach numbers
6. After a disturbance about the lateral axis, an aeroplane oscillates about the lateral axis at constant amplitude, the aeroplane is:
   1. Statically unstable, dynamically neutral
   2. Statically stable, dynamically unstable
   3. **Statically stable, dynamically neutral**
7. A light twin in a turn at 20°bank and 150 ky TAS. A more heavy aeroplane at same bank angle and same speed will:
   1. **Turn at the same radius**
   2. Turn at bigger radius
   3. Turn at smaller radius
8. The effect of the headwind is to ----- the climbe gradient and to ----- the rate of climb
   1. **Increase, No affect**
   2. Decrease, decrease
   3. Decrease, increase
9. Adverse aileron yaw can be counteracted by:
   1. Aileron reversal
   2. **Differential ailerons**
   3. Aileron snatch
10. An advantage of locating the engines at the rear of the fuselage, in comparison to a location beneath the wing, is:
    1. **Less influence on longitudinal control of thrust changes**
    2. A wing which is less sensitive to flutter
    3. Lighter wing construction

1. An aeroplane has a servo tab controlled elevator. what will happen when only the elevator jams during flight?
   1. The servo tab now works as negative trim tab
   2. The pitch control force doubles
   3. **Pitch control reverses direction**
2. The theoretical best range speed for jet aircraft is:
   1. Minimum drag speed
   2. Minimum power speed
   3. **1.32 times the minimum drag speed**
3. The greatest gliding range would be obtained from a wing at:
   1. At high AoA and max L/D ratio
   2. **Small AoA and best L/D ratio**
   3. Small AoA and Minimum L/D ratio
4. In a steady un accelerated glide:
   1. Resultant aerodynamic force is equal to drag
   2. **Resultant aerodynamic force is equal to weight**
   3. Resultant aerodynamic force is equal to lift
5. When an aircraft is in a climb at constant indicated airspeed:
   1. Thrust is equal to the weight acting along the flight path
   2. Thrust is less than the drag
   3. **The aerodynamic drag component is less than the thrust**
6. In a level turn:
   1. Lift equals the weight
   2. **The component of the lift in the vertical direction equals the weight**
   3. The component of the lift in the horizontal direction equals the weight
7. A control surface has its limitation in movement by:
   1. Control cable tension
   2. Primary stop at the control column
   3. **Primary stop at the control surface**
8. A horn balance in a control system has the following purpose
   1. To prevent flutter
   2. **To decrease stick force**
   3. To decrease longitudinal dihedral
9. A jet aeroplane equipped with inboard and outboard ailerons is cruising at normal mach no, in this case:
   1. **Only inboard ailerons are active**
   2. Only outboard ailerons are active
   3. Only spoilers will be active, not the ailerons
10. The speed for maximum sink rate in a glide, compared to speed for maximum distance Vmd is:
    1. Equal to Vmd
    2. **Slower than Vmd**
    3. Faster than Vmd
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14. An aircraft is placed in a level balanced turn and control released. It is spirally instable if:
    1. The bank reduces
    2. **Bank increases**
    3. Pitch attitude increases
15. At constant EAS, the effect on aerodynamic damping as height increases?
    1. Damping in pitch is reduced
    2. Damping in all axis increasesd
    3. **Damping in all axis reduced**
16. Deflecting elevator up, when the trim tab is in neutral, will cause the tab to:
    1. Move up relative to the elevator chord line
    2. Move down relative to the elevator chord line
    3. **Remain in line with elevator**
17. An aircraft approaching to land with its CG at the forward limit. It will be----to flare and VREF will be ---- than normal
    1. **Difficult, higher**
    2. Easy, lower
    3. Difficult, lower
18. An aircraft tendency to dutch roll may be reduced by:
    1. **Giving a wing anehedral**
    2. Reducing the size of fin
    3. Sweeping the wings
19. An example of differential aileron deflection during initiation of left turn is:
    1. **Left aileron 5° up, right aileron 2°down**
    2. Left aileron 2° up, right aileron 5° down
    3. Left aileron 2°up, right aileron 5°up
20. Control surface overbalancing may be result of:
    1. **The control surface CP being located in front of the surface hinge line**
    2. A sudden movement of the CP aft of the surface hinge line
    3. Applying excessive force to the controls
21. Differential aileron deflection:
    1. Increases the CLMax
    2. Is required to keep the total lift constant when ailerons are deflected
    3. **Equals the drag of the right and left aileron**
22. During the initiation of a turn with speedsbrakes extended, the roll spoiler function induces a spoiler deflection:
    1. On the up going wing only
    2. On the downgoing wing only
    3. **Downward on the upgoing and upward on the downgoing wing**
23. A propeller blade is twisted in order to:
    1. **Keep the local angle of attack constant along the blade**
    2. Allow higher mechanical stress
    3. Avoid local transonic flo to develop on the propeller blades
24. A propeller turning to the right, seen from behind. The asymmetric thrust effect in climb will:
    1. Roll to right
    2. **Yaw to left**
    3. Yaw to right
25. A propeller mounted forward of the engine is termed as:
    1. A paddle propeller
    2. **A tractor propeller**
    3. A pusher propeller
26. A propeller turns to right, seen from behind. The torque effect in take off will:
    1. **Roll the aeroplane to the left**
    2. Pitch the aeroplane noseup
    3. Roll the aeroplane to the right
27. 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?
    1. Jet roll toward live, propeller toward live
    2. Jet roll toward dead, propeller roll toward dead
    3. **Jet no change, propeller roll in the direction of dead engine**
28. A variable pitch propeller during take off will move towards:
    1. Coarse pitch to achieve highest possible thrust
    2. **Fine pitch to ensure engine can develop maximum power**
    3. Fine pitch to ensure minimum aerodynamic drag is generated
29. An engine failure can result in a (1) wind milling propeller, (2) non rotating propeller. Which statement about propeller drag is correct?
    1. **1 is larger than 2**
    2. 2 is larger than 1
    3. 1 is equal to 2
30. Asymmetric propeller blade effect is mainly induced by:
    1. **The inclination of the propeller axis to the relative airflow**
    2. Large angles of climb
    3. High speed
31. 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:
    1. VNE
    2. **VMO**
    3. VD
32. Constant speed propeller provide better performance than fixed pitch propeller because they:
    1. **Produce an almost maximum efficiency over a wider speed range**
    2. Have more blade surface area than a fixed pitch propeller
    3. Produce greater maximum thrust than a fixed pitch propeller
33. Flutter may be caused by
    1. High speed aerodynamic wing stall
    2. **Distortion by bending and torsion of the structure causing increasing vibration in the resonance frequency**
    3. Roll control reversal
34. Counter rotating propellers have the effect of
    1. increasing torque but decreasing the gyroscopic effect
    2. increasing torque and gyroscopic effecr
    3. **cancelling out the torque and gyroscopic effect**
35. Does the pitch angle of constant speed propeller alter in medium horizontal turbulence?
    1. Yes
    2. No
    3. **Yes, slightly**
36. With a swept wing aircraft, with an increase in altitude, which of the following statements about lateral stability is correct?
    1. **Static lateral stability remains the same, dynamic lateral stability decreases**
    2. Static lateral stability decrease, dynamic lateral stability increase
    3. Static lateral stability increases, dynamic lateral stability increase
37. Aileron reversal can be caused by:
    1. Fries type aileron at low AoA
    2. **Twisting of wing above reversal sped**
    3. Both A and B
38. Which statement is correct for a sideslip condition at constant speed and side slip angle, where geometric dihedral of an aeroplane is increased?
    1. **The required lateral control force increases**
    2. The required lateral control force decreases
    3. The required lateral control force does not changed
39. A jet transport aeroplane is in a straight climb at a constant IAS and weight. The operational limit that may be exceeded is:
    1. VMD
    2. **MMO**
    3. VMO
40. Flutter can be eliminated using:
    1. T tail
    2. Powered flying controls
    3. **Mass balancing**
41. For airplane with high wing loading
    1. Vertical gusts may have less influence on the load factor
    2. **Vertical gusts may have more influence on the load factor**
    3. Total drag is mainly profile drag
42. For an aeroplane one fixed value of VA the following applies , VA is
    1. The speed at which unrestricted application of elevator can be used, without exceeding the maximum manoeuvring limit load factor
    2. **The speed at which aeroplane stalls at manoeuvring limit load factor at MTOW**
    3. Just another symbol for rough air speed
43. The extreme right limitation for both V-n (gust and maneuver) diagram is created by the speed:
    1. VC
    2. **VD**
    3. VMO
44. The positive limit load factor for a transport jet with flaps extended is:
    1. 2.5
    2. **2.0**
    3. 1.5
45. The shape of gust load diagram is also determined by the following three vertical speeds ft/s (clean configuration)
    1. 25,55.75
    2. **25.50.66**
    3. 35.55.66
46. What can happen to aeroplane structure flying at speed exceed VA
    1. **It may break the elevator if it is fully deflected upwards**
    2. Permanent deformation
    3. It may cause damage if a turn is executed
47. What is the danger when recovering from the emergency descent?
    1. Engine stall
    2. **Structural damage**
    3. Directional stability
48. What wing is less sensitive to turbulence
    1. **Swept**
    2. Straight
    3. Winglets
49. Which of the following lists aeroplane features that each increases static lateral stability?
    1. Fuselage mounted engines, dihedral, T tail
    2. **High wing, sweepback, large and high vertical fin**
    3. Low wing, dihedral, elliptical wing planform
50. Which has the effect of increasing the load factor?
    1. Rearward CG location
    2. Increased aeroplane mass
    3. **Vertical gusts**
51. A normal shock wave:
52. is a discontinuity plane where temperature decreases
53. is a discontinuity plane which is always normal to surface
54. **develops anytime an aircraft is in the transonic range**
55. A shock stall occurs when laminar flow breaks down:
    1. at a high angle of attack and high Mach number
    2. behind the leading edge
    3. **behind the shock wave**
56. At what speed does a shock wave move forward over the ground?
57. aircraftÕs TAS
58. speed of sound at ground level
59. **aircraftÕs ground speed**

1. Compared to an oblique shock wave at the same Mach number, a normal shock wave has:
2. **higher compression**
3. lower compression
4. lower expansion

1. Critical Mach number is:
2. **the highest speed at which no parts of the aircraft are supersonic**
3. the highest speed at which the aircraft is certified to fly (MMO
4. the highest speed at which all parts of the aircraft are subsonic (< M1 0)
5. How does an aircraft with swept wings behave due to shock stall?
6. **a nose up pitching moment will be generated**
7. a swept wing is not significantly affected by shock stall
8. a nose down pitching moment will be generated
9. How does the density and temperature of the airflow vary as it passes through a shock wave?
10. **Density increases temperature increases**
11. Density decreases temperature decreases
12. Density decreases temperature increases
13. If it is required to increase the buffet margin from 0.3 g to 0.4 g which would be the correct action?
14. Flaps increment increased
15. Higher altitude at same Mach number
16. **Lower altitude at same Mach number**
17. If Mach trim is unserviceable you should:
18. fly at a constant speed
19. **limit the Mach number at which you fly**
20. limit the Mach number at which you fly
21. In transonic flight the increase in drag is due to:
22. the increase in angle of attack
23. the increase in parasite drag
24. **the shock wave**
25. Increasing speed above M CRIT in a swept wing aircraft could cause:
26. increased lift requiring high speed tuck
27. buffeting and nose-up pitch
28. **buffeting and nose down pitch**
29. structural failure of the wing due to shockwave formation Is it acceptable for a transport aircraft to exceed the Mach buffet onset speed?
30. Yes to fly at maximum speed
31. **No totally unacceptable**
32. Yes flying very high Mach number and very high altitude
33. Yes during approach
34. Maximum cruise altitude is limited by minimum load factor. If that altitude is exceeded:
35. Mach buffet will occur immediately
36. **turbulence may induce Mach buffet**
37. turbulence may exceed load factor

1. Position/movement of the AC on straight wing aircraft when accelerating from subsonic to supersonic flight?
2. Continues to move aft from the 25% chord position
3. Moves forward from the 25% chord to the leading edge
4. **Moves aft from the 25% chord position to the 50% chord position**
5. A jet aircraft is in a level turn the pilot would have to increase:
6. thrust and leave angle of attack constant
7. **angle of attack and thrust**
8. thrust and decrease angle of attack
9. angle of attack and leave thrust constant
10. 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?
11. Smaller than the light aircraft
12. Greater than the light aircraft
13. **the same as the light aircraft**
14. what other factors affect the glide range?
15. CL MAX
16. **Lift/drag ratio**
17. Weight and power required
18. For an aircraft at a given altitude what is the relationship between the TAS for minimum sink rate and for minimum glide angle?
19. V min sink rate = V min glide angle
20. V min sink rate < V min glide angle or V min sink rate > V min glide angle depending on type of aircraft
21. **V min sink rate < V min glide angle**
22. How does VMCG change with increasing field elevation and temperature?
23. It increases because with decreasing density you need a higher IAS to generate the same rudder force.
24. It increases because VMCG is related to V1 and VR and these speeds increase with decreasing density.
25. **It decreases because engine thrust decreases**
26. The effect of positive wing sweep on static directional stability is as follows:
    1. No effect
    2. **Stabilizing effect**
    3. Negative dihedral effect
27. The effect of vertical fin on the static stability of an aeroplane is as follows: (1=longitudinal, 2=lateral. 3= directional)
    1. No effect, positive, negative
    2. **No effect, negative, positive**
    3. Positive, negative, negative
28. The max aft position of the CG is amongst others limited by the :
    1. Maximum elevator deflection
    2. **Minimum value of stick force per g**
    3. Maximum longitudinal stability of the aeroplane
29. What will increase the sensitivity of a dutch roll
    1. **An increased static lateral stability**
    2. An increased static directional stability
    3. An increased anhedral
30. Propeller blade angle of attack is the angle between the chord and the:
31. direction of axis of the propeller
32. aeroplane heading
33. vector of True Air Speed
34. **relative airflow**
35. Propeller efficiency is best described as:
36. Brake HP to maximum power
37. **Thrust HP to shaft HP**
38. Thrust HP to overall power
39. The advantage of a constant speed propeller over a fixed pitch propeller is:
40. **nearly maximum efficiency over wide speed range**
41. higher maximum thrust available
42. higher maximum efficiency

1. The angle of attack of a fixed pitch propeller designed for cruising flight measured at its reference station is:
2. increases with an increase in TAS
3. decreases with an increase in RPM
4. **optimum in steady cruising flight only**
5. What is the disadvantage of increasing the number of propeller blades?
6. decreased power absorption
7. increased noise
8. **decreased efficiency**
9. increased vibration
10. What is the purpose of increasing the number of propeller blades?
11. Enable a longer undercarriage to be used
12. Increase the efficiency of the variable pitch mechanism
13. **Increase the power absorption**
14. Noise reduction
15. When an aircraft with a fixed pitch propeller climbs, the angle of attack of the propeller:
16. reduces to zero
17. remain the same
18. **Gets smaller**
19. In which situation the wing lift of an aeroplane in straight and level flight have the highest value
    1. Aft CG and take off thrust
    2. **Forward CG and idle thrust**
    3. Aft CG and idle thrust
20. A swept wing for given AoA and wing area:
    1. Increases lateral stability with reduced tip stall tendency
    2. **More laterally stable and produce less lift**
    3. Produce more lift and more laterally stable
21. Longitudinal static stability is created by the fact that the:
    1. Wing surface is the greater than horizontal tail surface
    2. **CG is located in the front of the neutral point of aeroplane**
    3. Aeroplane possesses a large trim speed range
22. What wing design features will help increase MCRIT?
23. Negative camber sweepback
24. Dihedral thin aerofoil
25. **Sweep back thin aerofoil**

1. When airflow becomes supersonic the pressure distribution on the top surface of the wing will become:
2. triangular
3. the same as subsonic
4. **rectangular**
5. 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?
6. In front of the normal shock wave
7. In front of the mach cone
8. **Within the mach cone**
9. If the sum of all the moment s in flight is not zero about one of the axis, an aeroplane will:
   1. Would fly a path with a constant curvature
   2. **Would experience an angular acceleration about that axis**
   3. Would be difficult to control
10. 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:
    1. Up
    2. **Down**
    3. None
11. Superstall is a condition:
    1. Where aircraft is in a spin
    2. **Stable stall with almost constant pitch attitude**
    3. Where wings have stall at high speed
12. When the control column is moved forward and to the right:
    1. The elevator goes up, right aileron moves up and left aileron goes down
    2. **The elevator goes down, right aileron moves up and left aileron goes down**
    3. The elevator goes down, right aileron moves down and left aileron goes up