

Question Paper Name: 5280 Aerospace Engineering Online Refresher Programmes for Higher Education Faculty 30th June 2019
Subject Name: Aerospace Engineering Online Refresher Programmes for Higher Education Faculty
Creation Date: 2019-06-30 13:01:39
Duration: 180
Total Marks: 100
Display Marks: Yes

Aerospace Engineering Online Refresher Programmes for Higher Education Faculty

Group Number : 1
Group Id : 489994240
Group Maximum Duration : 0
Group Minimum Duration : 120
Revisit allowed for view? : No
Revisit allowed for edit? : No
Break time: 0
Group Marks: 100

Aerospace Engineering Online Refresher Programmes for Higher Education Faculty

Section Id : 489994296
Section Number : 1
Section type : Online
Mandatory or Optional: Mandatory
Number of Questions: 121
Number of Questions to be attempted: 121
Section Marks: 100
Display Number Panel: Yes
Group All Questions: No

Sub-Section Number: 1
Sub-Section Id: 489994324
Question Shuffling Allowed : Yes

Question Number : 1 **Question Type :** MCQ **Option Shuffling :** No **Display Question Number :** Yes **Single Line Question Option :** No **Option Orientation :** Vertical

Correct Marks : 1 **Wrong Marks :** 0

Which of the following response results if damping ratio is positive but less than one while keeping natural frequency to be constant?

- a) Under-damped exponentially decaying sinusoidal motion
- b) Critically damped exponentially decaying sinusoidal motion
- c) Over-damped exponentially decaying sinusoidal motion
- d) Un-damped sinusoidal motion

Options :

2. 2
3. 3
4. 4

Question Number : 2 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The typical values of roots for longitudinal dynamic mode are $\lambda_{1,2} = -0.04 \pm i 0.4$. What will be the period and time to damp to half amplitude respectively?

- a) 157 sec and 1.73 sec respectively
- b) 15.7 sec and 17.3 sec respectively
- c) 1.57 sec and 1.73 sec respectively
- d) 1.57 sec and 17.3 sec respectively

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 3 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The typical values of roots for longitudinal stick fixed case for an airplane with time characteristics of 1.5 are given by $(\lambda_{1,2} = -0.04 \pm i 0.05)$ – Eq.(1) and $(\lambda_{3,4} = -2.5 \pm i 2.0)$ – Eq.(2). Which mode is represented by these equations?

- a) Eq.(1) represents short period mode while Eq.(2) represents Phugoid mode
- b) Eq.(1) and Eq.(2) both represent short period mode
- c) Eq.(1) represents Phugoid mode while Eq.(2) represents short period mode
- d) Eq.(1) and Eq.(2) both represent Phugoid mode

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 4 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- | | |
|----------------------------|--|
| (I) $C_{m_{\dot{\alpha}}}$ | (i) damping derivative |
| (II) C_{m_0} | (ii) stability criteria derivative |
| (III) $C_{m_{\delta_e}}$ | (iii) pitching moment coefficient at zero lift |
| (IV) C_{m_q} | (iv) control power derivative |

- a) (I)-(ii), (II)-(iii), (III)-(iv), (IV)-(i)
 b) (I)-(ii), (II)-(iv), (III)-(iii), (IV)-(i)
 c) (I)-(ii), (II)-(iii), (III)-(i), (IV)-(iv)
 d) (I)-(ii), (II)-(i), (III)-(iii), (IV)-(iv)

Options :

1. 1
 2. 2
 3. 3
 4. 4

Question Number : 5 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the symbol with respective stability derivative and choose the correct option

- a) $C_{n_{\beta}}$ is a stability criteria derivative and C_{n_p} is cross derivative
 b) $C_{n_{\beta}}$ is a damping derivative and C_{n_p} is cross derivative
 c) $C_{n_{\beta}}$ is a damping derivative and C_{n_p} is control power derivative
 d) C_{n_r} is a stability criteria derivative and $C_{n_{\delta_r}}$ is cross derivative

Options :

1. 1
 2. 2
 3. 3
 4. 4

Question Number : 6 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following with respect to aircraft motion after disturbance.

- | | |
|---|----------------------------|
| I Statically stable & dynamically unstable | (i) Pure convergence |
| II Statically & dynamically stable (Oscillatory) | (ii) Damped oscillations |
| III Statically & dynamically stable (Non-oscillatory) | (iii) Pure divergence |
| IV Statically unstable & dynamically unstable | (iv) Undamped oscillations |

- a) (I)-(ii), (II)-(iii), (III)-(iv), (IV)-(i)
 b) (I)-(ii), (II)-(iv), (III)-(iii), (IV)-(i)
 c) (I)-(iv), (II)-(iii), (III)-(i), (IV)-(ii)
 d) (I)-(iv), (II)-(ii), (III)-(i), (IV)-(iii)

1. 1
2. 2
3. 3
4. 4

Question Number : 7 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following with respect to longitudinal dynamics for stick free case.

- | | |
|-----------------|---|
| A. Phugoid Mode | I combination of lateral-directional motion |
| B. Dutch roll | II Motion about longitudinal axis |
| C. Pure roll | III long period with weak damping |
- a) A-I, B-II, C-III
 - b) A-II, B-I, C-III
 - c) A-III, B-II, C-I
 - d) A-III, B-I, C-II

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 8 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The following accord provides for recognition of programs accredited for the engineer track:

- a) Manila Accord
- b) Paris Accord
- c) London Accord
- d) Washington Accord

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 9 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is FALSE with regard to complex engineering problems:

- a) Involve the use of existing materials
- b) Involve creative use of research-based knowledge
- c) Involve diverse groups of stakeholders
- d) Require judgment in decision making

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 10 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true for pitot tube shown in the swayam video:

- a) Three ports in the tube: one for stagnation, one for dynamic and one for static pressure
- b) Two ports in the tube: one for static, one for dynamic pressure
- c) Two ports in the tube: one for static, one for stagnation pressure
- d) Two ports in the tube: one for stagnation, one for dynamic pressure

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 11 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following Aircraft instrument uses atleast two pressure inputs out of static /dynamic /total pressure

- a) Rate gyro
- b) Turn and bank indicator
- c) Airspeed Indicator
- d) Vertical speed Indicator

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4



Correct Marks : 1 Wrong Marks : 0

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The aircraft instrument "altimeter" uses only the following pressure input:

- a) Static pressure
- b) Dynamic pressure
- c) Stagnation pressure
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 2
Sub-Section Id: 489994325
Question Shuffling Allowed : Yes

Question Number : 13 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following is **not** a reason for specifying Airworthiness Requirements?

- a) To ensure safety of operation
- b) To reduce operating cost of an aircraft
- c) Lead to uniformity & standardization in reporting data
- d) To incorporate lessons learnt from past experience

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 14 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

It is said that *Customer Requirements always Creep*? What is the meaning of this phrase?

- a) Requirements change over a period of time and lead to an increase in Cost
- b) Requirements specified by a Customer are fixed and non-negotiable
- c) Requirements drive the Design, and hence affect its strength characteristics
- d) Requirements are driven by the Technology, which changes with passage of time

Options :

- 1. 1

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3. 3
4. 4

Sub-Section Number: 3
Sub-Section Id: 489994326
Question Shuffling Allowed : Yes

Question Number : 15 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

How is load alleviation obtained in A340?

- a) Center of gravity management system
- b) Increasing Thrust
- c) Extended fly-through-system
- d) Extensive Avionics integration

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 16 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the main drawback of a Blended Wing Body (BWB) aircraft?

- a) Lesser number of windows
- b) Difficulty in Emergency Evacuation
- c) Higher Aerodynamic loading on wing leading edges
- d) Heavier than Conventional aircraft

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 17 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Luxury and Comfort
- b) Transonic flight speeds
- c) High Range
- d) High Endurance

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 18 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the main reason for converting a Passenger aircraft to Cargo at the end of its useful life?

- a) Availability of new technologies
- b) Economically infeasible
- c) Error in the design
- d) New regulations for passenger aircraft

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 19 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Where is the cargo stored in B737?

- a) Containerized Cargo Bay
- b) Pelletized Cargo Bay
- c) Overhead bins in Passenger Cabin
- d) In the Cargo bays located in the front and behind the passenger Cabin

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 20 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) To reduce fuel consumption
- b) To ensure lower vibration levels
- c) To keep the pilot safe from high accelerations
- d) To avoid excessive loads on control surfaces

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 21 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

How is *Tailsitting* avoided in Concorde SST aircraft?

- a) Fuel is shifted forward
- b) Fuel is shifted rearward
- c) Droop Nose
- d) Deflection of Elevons

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 22 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the key design requirement for Non-VSTOL Naval Fighter aircraft?

- a) High Range
- b) Lower Fuel Consumption
- c) Better Corrosion Resistance
- d) High Endurance

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 23 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Load relief on wing
- b) Weight savings
- c) Passenger safety
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 24 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which requirement is worsened by providing Canards in fighter aircraft?

- a) Load distribution
- b) Stealth
- c) Maneuverability
- d) Payload capacity

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 25 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the purpose of the top portion of House of Quality (HoQ) chart?

- a) Identifying correlations in design features
- b) Listing down the customer needs
- c) Listing down the customer priorities
- d) Listing down the design features

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 26 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) 20 – 30 %
- b) 30 – 40 %
- c) 40 – 50 %
- d) 50 - 60%

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 27 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the key assumption in estimation of mission fuel fraction weight?

- a) Fuel consumption is independent of aircraft weight
- b) Amount of Reserve fuel carried is ignored
- c) Fuel consumed in each mission segment is proportional to aircraft weight
- d) Fuel consumption in all segments except Cruise and Loiter can be ignored

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 28 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the value of optimum L/D for maximizing Loiter of a propeller engine a/c?

- a) $[L/D]_{\max}$
- b) $0.866[L/D]_{\max}$
- c) $0.5[L/D]_{\max}$
- d) $0.707[L/D]_{\max}$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 29 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Laminar flow is less resistant to separation compared to Turbulent flow
- b) Skin Friction Drag in Laminar flow is 33% of that in Turbulent flow
- c) Form Drag in Laminar flow is 33% of that in Turbulent flow
- d) Laminar flow results in much higher Lift Coefficient, hence a smaller wing area

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 30 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Why do Pusher propellers have low base drag even with high aft fuselage angles?

- a) Since Pusher propellers have lower diameters
- b) Due to washing away of separated flow by the engines
- c) Since Pusher propellers rotate at lower RPM
- d) Since Pusher propellers do not have swirling flow

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 31 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the $C_{L_{\alpha}(\text{with strake})}$ for a low angle of attack flight, if the $C_{L_{\alpha}(\text{without strake})} =$

$0.1, S = 100 \text{ m}^2$ and $S_{\text{strake}} = 10 \text{ m}^2$.

- a) 0.110
- b) 0.011
- c) 0.010
- d) 0.100

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 32 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Take-off Distance
- b) Missed Approach Gradient
- c) Stalling Speed
- d) Sustained Turn Rate

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 33 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following constraints depend only on Thrust to Weight ratio?

- a) Ceiling
- b) Climb Gradient
- c) Specific Excess Power
- d) Maximum Speed

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 34 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the position of Landing gear and Flaps during second stage of climb segment?

- a) Landing gear down and flaps down
- b) Landing gear up and flaps up
- c) Landing gear down and flaps up
- d) Landing gear up and flaps down

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 35 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

the values of T/W and W/S for the design point in a Constraint Diagram?

- a) Lowest T/W and Lowest W/S
- b) Lowest T/W and Highest W/S
- c) Highest T/W and Highest W/S
- d) Highest T/W and Lowest W/S

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Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 36 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is typically not an Airworthiness Requirement for a Military aircraft?

- a) Specific Excess Power
- b) Sustained Turn Rate
- c) Ceiling
- d) Second Stage Climb Gradient

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 37 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the typical value of landing weight fraction, β for Military aircraft?

- a) 1.00
- b) 0.75
- c) 0.50
- d) 0.25

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 38 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

years of engineering effort were required in the development phase of one prototype of an aircraft. What would be the approximate additional man-years of engineering effort

needed for a production run of 500 aircraft?

- a) 150
- b) 25000
- c) 1500
- d) 250

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 39 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is Ferry Range?

- a) Range with zero payload and including reserve fuel
- b) Range assuming all the mission fuel is utilized for cruise flight alone
- c) Range with maximum possible payload
- d) Range with maximum payload and reserve fuel

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 40 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the key effect on harmonic range (RH) and range with full fuel tank (RB) when limit on max landing weight is specified?

- a) RH reduces and RB increases
- b) RH increases and RB reduces
- c) Both RH and RB reduce
- d) Both RH and RB increase

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 41 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical



- a) High wing
- b) Mid wing
- c) Low wing
- d) None of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 42 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the main drawback of Twin Vertical Tail layout?

- a) Reduced maneuverability
- b) Larger than Conventional tails
- c) Bad for Maintenance
- d) High Aerodynamic drag

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 43 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which boundaries of V-n diagram **cannot** be intentionally exceeded?

- a) Top and bottom
- b) Left and right
- c) Left and top
- d) Right and top

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 44 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Air loads
- b) Inertia
- c) Power plant
- d) Limit

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 4
 Sub-Section Id: 489994327
 Question Shuffling Allowed : Yes

Question Number : 45 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The Mach number range of hypersonic flow (until the continuum hypothesis holds for air), is

- a) $5 \leq M \leq 25$
- b) $5 \leq M \leq 40$
- c) $5 \leq M \leq 55$
- d) $5 \leq M \leq 75$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 46 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Considering a steady and inviscid flow in a convergent-Divergent nozzle, with a normal shock placed in the divergent portion. The static pressure along the nozzle, downstream of the normal shock, will

- a) remain constant
- b) increase isentropically to the static pressure at the nozzle exit
- c) decrease isentropically to the static pressure at the nozzle exit
- d) increase or decrease, depending upon the static pressure at the nozzle exit

Options :

- 1. 1
- 2. 2

Question Number : 47 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

For a flow across an oblique shock wave, which of the statement is TRUE?

- a) Component of velocity normal to shock wave decreases while tangential component increases.
- b) Component of velocity normal to shock wave increases while tangential component decreases.
- c) Component of velocity normal to shock wave decreases while tangential component remains unchanged.
- d) Component of velocity normal to shock wave is unchanged while tangential component decreases.

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 48 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The Air deviates from the perfect gas behavior when

- a) pressure decreases and temperature increases
- b) pressure increases and temperature decreases
- c) when both pressure and temperature decreases
- d) when both pressure and temperature increases

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 5
Sub-Section Id: 489994328
Question Shuffling Allowed : Yes

Question Number : 49 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

a) $P + \frac{1}{2}\rho V^2 = P_0$

b) $\frac{\gamma}{(\gamma+1)} \frac{P}{\rho} + \frac{V^2}{2} = \frac{\gamma}{(\gamma+1)} \frac{P_0}{\rho_0}$

c) $\frac{\gamma}{(\gamma-1)} \frac{P}{\rho} + \frac{V^2}{2} = \frac{\gamma}{(\gamma-1)} \frac{P_0}{\rho_0}$

d) $\gamma \frac{P}{\rho} + \frac{V^2}{2} = \gamma \frac{P_0}{\rho_0}$

Options :

1. 1
2. 2
3. 3
4. 4

Sub-Section Number: 6
Sub-Section Id: 489994329
Question Shuffling Allowed : Yes

Question Number : 50 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following is CORRECT?

- a) With increase of temperature, the viscosity of air decreases and viscosity of water increases.
- b) With increase of temperature, the viscosity of air increases and viscosity of water decreases.
- c) With increase of temperature, the viscosity of BOTH air and water increases.
- d) With increase of temperature, the viscosity of BOTH air and water decreases.

Options :

1. 1
2. 2
3. 3
4. 4

Sub-Section Number: 7
Sub-Section Id: 489994330
Question Shuffling Allowed : Yes

Question Number : 51 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

" ρ " is density)

- a) $\lim_{M_1 \rightarrow \infty} \frac{\rho_2}{\rho_1} = 2$
- b) $\lim_{M_1 \rightarrow \infty} \frac{\rho_2}{\rho_1} = 4$
- c) $\lim_{M_1 \rightarrow \infty} \frac{\rho_2}{\rho_1} = 6$
- d) $\lim_{M_1 \rightarrow \infty} \frac{\rho_2}{\rho_1} = \infty$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 8
Sub-Section Id: 489994331
Question Shuffling Allowed : Yes

Question Number : 52 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following is true due the expansion of the gas through a nozzle

- a) Mach number increases
- b) Pressure decreases
- c) Temperature decreases
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 53 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

A CD nozzle is said to be choked when

- a) Pressure at the Exit is equal to Ambient Pressure ($p_e = p_a$)
- b) Area Ratio is maximized for optimum expansion
- c) Pressure at some point in the nozzle equals Critical Pressure ($p = p^*$)
- d) Nozzle operates shock free

Options :

2. 2
3. 3
4. 4

Sub-Section Number: 9
Sub-Section Id: 489994332
Question Shuffling Allowed : Yes

Question Number : 54 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the value of specific heat ratio is 1.4, the critical pressure ratio of the nozzle is

- a) 0.5823
- b) 0.5328
- c) 0.5128
- d) 0.5283

Options :

1. 1
2. 2
3. 3
4. 4

Sub-Section Number:
Sub-Section Id: 489994333
Question Shuffling Allowed : Yes

Question Number : 55 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The state of a system is represented by its

- a) size
- b) properties
- c) surrounding
- d) process

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 56 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

- a) remains constant
- b) decreases
- c) may increase or decrease
- d) will increase

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 11
Sub-Section Id: 489994334
Question Shuffling Allowed : Yes

Question Number : 57 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For an under-expanded nozzle the exit pressure is

- a) Equal to external pressure
- b) Lower than the external pressure
- c) Higher than external pressure
- d) Zero

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 12
Sub-Section Id: 489994335
Question Shuffling Allowed : Yes

Question Number : 58 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

times. If the later sphere is outside the initial sphere, the particle Mach number is

- a) Supersonic
- b) transonic
- c) subsonic
- d) sonic

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 13
Sub-Section Id: 489994336
Question Shuffling Allowed : Yes

Question Number : 59 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statements regarding flow across a curved shock wave is FALSE

- a) Rotational
- b) Compressible
- c) One-dimensional
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 14
Sub-Section Id: 489994337
Question Shuffling Allowed : Yes

Question Number : 60 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) Do not exist.
- b) Remains constant.
- c) Is not a constant.
- d) Equals total temperature.

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 15
Sub-Section Id: 489994338
Question Shuffling Allowed : Yes

Question Number : 61 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The reason for hypersonic reentry capsules to have a blunt leading edge is

- a) Aerodynamic heating
- b) Aero-braking
- c) Payload consideration
- d) None of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 16
Sub-Section Id: 489994339
Question Shuffling Allowed : Yes

Question Number : 62 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) Reynolds number
- b) Prandtl number
- c) Euler number
- d) Mach number

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 63 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The compressibility of water (at 1 atm) under isothermal conditions is

- a) $7 \times 10^{-3} \text{ m}^2/\text{N}$
- b) $5 \times 10^{-10} \text{ m}^2/\text{N}$
- c) $6 \times 10^{-17} \text{ m}^2/\text{N}$
- d) $0.05 \text{ m}^2/\text{N}$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 64 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

In which of the following compressors the compressibility considerations are NOT important while designing the compressor?

- a) Hydrogen compressors
- b) Air compressors
- c) Freon compressors
- d) All the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

The exit velocity in the nozzle increases as per _____

- a) Stagnation point
- b) Continuity equation
- c) Prandtl Number
- d) Newton's law

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 17
Sub-Section Id: 489994340
Question Shuffling Allowed : Yes

Question Number : 66 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Sum of enthalpy and kinetic energy remains a constant in _____

- a) Polytropic flow
- b) Isentropic flow
- c) Adiabatic flow
- d) Mechanical flow

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 18
Sub-Section Id: 489994341
Question Shuffling Allowed : Yes

Question Number : 67 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) Isothermal
- b) Adiabatic
- c) Quasi-static
- d) None

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 68 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The sonic velocity is largest in which of the following?

- a) Water
- b) Steel
- c) Kerosene
- d) Air

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 69 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

According to *von Karman's* supersonic law, the region outside the Mach cone is known as

- a) zone of action
- b) zone of silence
- c) control volume
- d) none

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 70 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is incorrect?

- a) A shock wave occurs in divergent section of a nozzle when the compressible flow changes abruptly
- b) A plane moving at supersonic state is not heard by the stationary observer on the ground until it passes him because zone of disturbance in Mach cone trails behind the plane
- c) A divergent section is added to a convergent nozzle to obtain supersonic velocity at the throat
- d) none

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 20
Sub-Section Id: 489994343
Question Shuffling Allowed : Yes

Question Number : 71 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following flow does not experience the shearing stress?

- a) Pseudoplastic
- b) Inviscid
- c) Dilatant
- d) Newtonian

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 72 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) the maximum length of the duct is the sonic length
- b) the Mach number always increases as one moves downstream
- c) the static pressure always decreases as one moves downstream
- d) none of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 21
 Sub-Section Id: 489994344
 Question Shuffling Allowed : Yes

Question Number : 73 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following statements:

- I. Frozen flow in nozzle is isentropic
 - II. Equilibrium flow in nozzle is isentropic
- a) Only I is TRUE
 - b) Only II is TRUE
 - c) Both I & II are TRUE
 - d) Both I & II are FALSE

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 74 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In over-expanded nozzle, the pressure equalization takes place through

- a) Normal shock wave
- b) Subsonic diffusion
- c) Both (a) and (b)
- d) When Exit Pressure equals Ambient Pressure ($p_e = p_a$)

Options :

2. 2
3. 3
4. 4

Question Number : 75 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A supersonically moving aircraft disturbs the air stream

- a) Behind the Mach lines
- b) On both sides of the Mach lines
- c) Ahead of the Mach lines
- d) Beyond the ends of the Mach lines

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 76 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Pitot temperature and pressure in an incompressible flow is 1000°C and 120 kPa respectively, along with the static pressure measured as 80 kPa. The estimated air-velocity is

- a) 286 m/s
- b) 267 m/s
- c) 295 m/s
- d) 256 m/s

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 77 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) Low molecular weight at low temperature
- b) high molecular weight at low temperature
- c) high molecular weight at high temperature
- d) Low molecular weight at high temperature

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 78 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Viscous/Inviscid interactions are predominantly seen for

- a) Transonic flows
- b) Supersonic flows
- c) Hypersonic flows
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 79 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The mean free path of the fluid flowing over a body of dimension 1 m is of the order of nanometers. The flow

Mach number is 0.5. Density is considered a variable and viscosity is not taken into consideration. What kind of flow are we talking about?

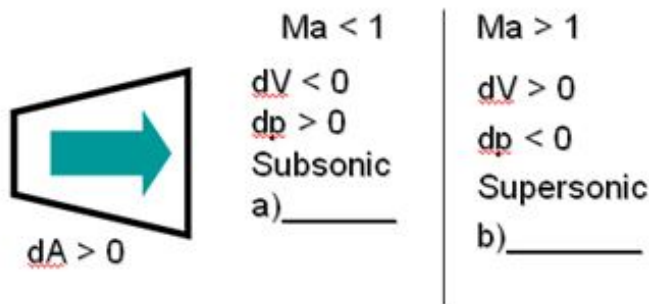
- a) Free-molecular, transonic, compressible, inviscid flow
- b) Continuum, subsonic, compressible, viscous flow
- c) Continuum, subsonic, incompressible, inviscid flow
- d) Continuum, subsonic, compressible, inviscid flow

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Correct Marks : 1 Wrong Marks : 0

Consider the following figure.



(a) and (b), respectively, are

- a) nozzle and diffuser
- b) diffuser and nozzle
- c) Both nozzles
- d) Both diffusers

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 81 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A characteristic curve is a curve

- a) across which a variable, e.g. the velocity, is continuous, but the derivatives of that variable are indeterminate
- b) the governing PDE can be reduced to an ordinary differential equation
- c) along which disturbances in the flow propagate
- d) all of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 82 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

- a) is a curve which is everywhere perpendicular to the stream lines in a subsonic flow
- b) is a wave which is perpendicular to the stream lines in a supersonic flow
- c) is perpendicular to the stream lines when the flow is sonic
- d) has the same slope as an arbitrary oblique shock wave

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 83 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When heat is added to a compressible flow

- a) the flow temperature will always increase
- b) the Mach number will always increase
- c) the entropy may decrease
- d) the stagnation temperature of the flow will always increase

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 84 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider an airfoil kept in a flow with a free-stream velocity of 20 m/s. The velocity at a given point on the airfoil is 40 m/s. The pressure coefficient at this point will be _____

- a) 2
- b) -3
- c) 3
- d) -1/3

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Correct Marks : 1 Wrong Marks : 0

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An oblique shock wave with a wave angle of $\beta = 80^\circ$ is generated from a wedge angle of $\theta = 20^\circ$. The ratio of Mach number downstream of the shock to its normal component will be

- a) $2/\sqrt{3}$
- b) 0.87
- c) 0.5
- d) 2

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 86 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true

- a) The density of water is maximum at 2°C .
- b) The volumetric change of the fluid caused by a resistance is known as compressibility.
- c) The bulk modulus of elasticity decreases with increase in pressure.
- d) Viscosity of liquids is appreciably affected by change in pressure.

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 22
Sub-Section Id: 489994345
Question Shuffling Allowed : Yes

Question Number : 87 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The condition for longitudinal equilibrium can be stated as follows:

- a) summation of moments about longitudinal axis is zero
- b) summation of moments about lateral axis is zero
- c) summation of moments about vertical axis is zero
- d) all of the above

Options :

- 1. 1

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3. 3

4. 4

Question Number : 88 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

A body that tends to return to its trim condition after initial disturbance from trim condition is said to be

- a) statically stable
- b) statically unstable
- c) neutrally stable
- d) dynamically stable

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 89 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Trim angle of attack of an aircraft can be increased by

- a) increasing up flap deflection
- b) increasing down flap deflection
- c) increasing angle of incidence of horizontal stabilizer
- d) None of the above

Options :

1. 1

2. 2

3. 3

4. 4

Question Number : 90 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following option cannot be used to alter the longitudinal trim condition during flight of an aircraft?

- a) elevator
- b) stabilator
- c) fixed tab
- d) variable tab

Options :

1. 1

3. 3

4. 4

Question Number : 91 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Necessary criteria for longitudinal balance at positive angle of attack and static instability are

- a) C_{m_0} and C_{m_α} are positive
- b) C_{m_0} and C_{m_α} are negative
- c) C_{m_0} is positive and C_{m_α} is negative
- d) C_{m_0} is negative and C_{m_α} is positive

Options :

1. 1

2. 2

3. 3

4. 4

Sub-Section Number: 23

Sub-Section Id: 489994346

Question Shuffling Allowed : Yes

Question Number : 92 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Inherent characteristics of a negatively cambered wing is to have

- a) Positive $C_{m_{ac}}$
- b) negative $C_{m_{ac}}$
- c) zero $C_{m_{ac}}$
- d) zero $C_{m_{c/4}}$

Options :

1. 1

2. 2

3. 3

4. 4

Sub-Section Number: 24

Sub-Section Id: 489994347

Question Shuffling Allowed : Yes

Question Number : 93 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) long range
- b) high speed
- c) maneuverability
- d) Stability

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 25
Sub-Section Id: 489994348
Question Shuffling Allowed : Yes

Question Number : 94 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following parameter variation does not lead to change in rudder control power?

- a) tail arm
- b) tail area
- c) tail efficiency
- d) all of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 26
Sub-Section Id: 489994349
Question Shuffling Allowed : Yes

Question Number : 95 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following contributes maximum to the lateral stability of the aircraft?

- a) Fuselage
- b) Vertical tail
- c) Power plant
- d) All of above

Options :

- 1. 1

3. 3
4. 4

Sub-Section Number: 27
Sub-Section Id: 489994350
Question Shuffling Allowed : Yes

Question Number : 96 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The slope of pitching moment curve will have maximum positive value

- a) if the thrust line lies above the center of gravity
- b) if the thrust line lies below the center of gravity
- c) if the thrust line is in the line with the center of gravity
- d) none of the above

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 97 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For which of the following condition, the stick fixed neutral has most forward location?

- a) power-off conditions with propellers wind-milling
- b) propellers running at low power
- c) propellers running at high power
- d) none of the above

Options :

1. 1
2. 2
3. 3
4. 4

Sub-Section Number: 28
Sub-Section Id: 489994351
Question Shuffling Allowed : Yes

Question Number : 98 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

case?

- a) $\delta_e = -10^\circ$
- b) $\delta_e = -5^\circ$
- c) $\delta_e = -0^\circ$
- d) $\delta_e = 5^\circ$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 99 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following can be used as criterion for estimating stick free neutral point during flight testing?

- a) $C_{m_{\delta_e}}$
- b) $d\delta_e/dC_L$
- c) C_{m_a} (stick free)
- d) $d(F_s/q)/dC_L$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 100 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Negative static margin indicates that the aircraft is

- a) statically stable
- b) statically unstable
- c) Neutrally stable
- d) Dynamically stable

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 101 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The center of gravity location for $(d\delta_v/dC_L) = 0$ can be used to find out

- a) stick fixed maneuver point
- b) stick free maneuver point
- c) stick fixed neutral point
- d) stick free neutral point

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number:

30

Sub-Section Id:

489994353

Question Shuffling Allowed :

Yes

Question Number : 102 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following is responsible for damping in yaw?

- a) Fuselage of the airplane
- b) Altitude of the airplane
- c) Vertical Tail of the airplane
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number:

31

Sub-Section Id:

489994354

Question Shuffling Allowed :

Yes

Question Number : 103 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0



- a) Increase the fuselage stability at high angle of sideslip
- b) Reduce the tendency of vertical tail to stall
- c) Both (a) & (b)
- d) None of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 104 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following expression gives the roll approximation?

- a) L_r
- b) L_p
- c) $L_{\delta r}$
- d) $L_{\delta a}$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 32
Sub-Section Id: 489994355
Question Shuffling Allowed : Yes

Question Number : 105 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

The location of center of gravity where the elevator angle required to accelerate the airplane by one g vanishes is called

- a) stick fixed neutral point
- b) stick free neutral point
- c) stick fixed maneuver point
- d) stick free maneuver point

Options :

- 1. 1
- 2. 2
- 3. 3

Sub-Section Number: 33
Sub-Section Id: 489994356
Question Shuffling Allowed : Yes

Question Number : 106 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The change in rolling moment coefficient due to change in sideslip angle is called

- a) Weathercock stability
- b) Damping in roll
- c) Dihedral effect
- d) Cross derivative

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 34
Sub-Section Id: 489994357
Question Shuffling Allowed : Yes

Question Number : 107 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following statement is correct?

- a) Static stability is more than maneuvering stability of an aircraft
- b) Static stability is less than maneuvering stability of an aircraft
- c) Static stability and maneuvering stability of an aircraft are generally same
- d) None of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 108 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) Wing dihedral angle
- b) Wing sweep angle
- c) Mid wing configuration
- d) Vertical Tail

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 109 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following the following is least true for phugoid mode of an aircraft?

- a) Altitude varies
- b) Speed varies
- c) Angle of attack varies
- d) Pitch angle varies

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 110 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

In which of the following option, rudder power has least importance?

- a) adverse yaw
- b) asymmetric flight
- c) cross-wind landing
- d) pull up maneuver

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 111 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) canard
- b) elevator
- c) stabilator
- d) flaperon

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 112 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following option gives the maximum lateral stability?

- a) Low wing configuration
- b) Mid wing configuration
- c) High wing configuration
- d) All of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 113 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

Which of the following option represents the control derivatives?

- a) C_{l_β} and C_{n_β}
- b) C_{l_p} and C_{n_r}
- c) $C_{l_{\delta a}}$ and $C_{n_{\delta r}}$
- d) C_{l_r} and C_{n_p}

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 114 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 0.5 Wrong Marks : 0

- a) Dutch roll
- b) Stall
- c) Flutter
- d) None of the above

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Sub-Section Number: 35
Sub-Section Id: 489994358
Question Shuffling Allowed : Yes

Question Number : 115 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following option with respect to sign convention for an aircraft having static lateral and directional stability is wrong?

- a) $C_{n_\beta} = 0.13, C_{l_\beta} = 0.19$
- b) $C_{n_\beta} = 0.13, C_{l_\beta} = -0.19$
- c) $C_{n_p} = -0.049, C_{l_p} = -0.38$
- d) $C_{n_r} = -0.18, C_{l_r} = -0.19$

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 116 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What will be the value of angle of attack of horizontal stabilizer with deflected primary control surface for stick fixed case for the following given data?

$$\alpha_w = 10^\circ \quad \epsilon = 1^\circ \quad i_t = -1^\circ \quad i_w = 2^\circ \quad \tau = 0.5 \quad \delta_e = 4^\circ$$

- a) 4°
- b) 6°
- c) 8°
- d) 10°

Options :

2. 2
3. 3
4. 4

Question Number : 117 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An aircraft is flying at a speed of 100 m/s. The relative speed at vertical tail is 80 m/s. What will be the vertical tail efficiency?

- a) 1.25
- b) 1.0
- c) 0.8
- d) 0.64

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 118 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider an aircraft having wing area of 30 m^2 and vertical tail area of 6 m^2 . The wing span is 15 m and mean aerodynamic chord of the wing is 2 m. Vertical tail moment arm is 6 m long. What will be the value of vertical tail volume coefficient?

- a) 0.02
- b) 0.08
- c) 0.5
- d) 0.6

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 119 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

be the angular velocity of air plane about lateral axis during a turning flight at load factor and speed of 2 and 100 m/s respectively?

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- a) 0.0981
- b) 0.1962
- c) 0.245
- d) 0.1476

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 120 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What will be the load factor produced perpendicular to the airplane during a pull-up maneuver at a speed of 50 m/s and an angular velocity of 0.1476 rad/sec?

- a) 1.25
- b) 1.5
- c) 1.75
- d) 2

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4

Question Number : 121 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Increment in tail angle of attack due to angular velocity during symmetric maneuver for the following data comes out to be

$$l_t = 5\text{m} \quad q = 0.4 \text{ rad/sec} \quad V = 100 \text{ m/s}$$

- a) -0.2 rad
- b) -0.02 rad
- c) +0.02 rad
- d) +0.2 rad

Options :

- 1. 1
- 2. 2
- 3. 3
- 4. 4