National Testing Agency

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Aerospace Engineering Online Refresher Programmes for Higher Education Faculty

Group Number :	1
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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 :

1. 1
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 ± 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 ± i 0.05) – Eq.(1) and ($\lambda_{3,4}$ = -2.5 ± 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

Match the symbol with respective stability derivative and choose correct option

(I)	C_{m_α}	(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_β} is a stability criteria derivative and C_{n_p} is cross derivative

b) C_{n_β} is a damping derivative and C_{n_p} is cross derivative

c) C_{n_β} 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)

Options :

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

The ability to solve Complex Engineering Problems is an important attribute of engineering graduate.

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

Question Number : 12 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 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

2. 2
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

What is the main design feature of a Business Jet aircraft?

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

Why the Maximum Maneuver Speed is typically lower than Maximum Level Speed?

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

Why are engines mounted in pods below the Wings?

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

What is the typical range of empty weight fraction of a passenger transport aircraft?

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

What is the most compelling reason to try and maintain Laminar flow on a wing?

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 $C_{L_{\alpha(with\ strake)}}$ for a low angle of attack flight, if the $C_{L_{\alpha(without\ strake)}} = 0.1, S = 100\ m^2$ and $S_{strake} = 10\ m^2$.

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

Which of the following Constraints depend only on W/S?

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

Which are 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

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

50 man-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

Correct Marks : 1 Wrong Marks : 0

What is the best wing layout for a heavy transport aircraft?

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

What is the type of load that leads to buffeting in an aircraft?

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

3. 3

4. 4

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

The Bernoulli equation for compressible flow is,

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

For a flow across Normal shock wave, when $M_1 \rightarrow \infty$ then which of the following is CORRECT? (where, "ρ" is density)

a) $\lim_{M_1 \to \infty} \frac{\rho_2}{\rho_1} = 2$

b) $\lim_{M_1 \to \infty} \frac{\rho_2}{\rho_1} = 4$

c) $\lim_{M_1 \to \infty} \frac{\rho_2}{\rho_1} = 6$

d) $\lim_{M_1 \to \infty} \frac{\rho_2}{\rho_1} = \infty$

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 :

1. 1
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: 10
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

Correct Marks : 0.5 Wrong Marks : 0

At constant temperature heat addition, entropy

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

A particle moving at uniform velocity in sea-level standard air creates two disturbance spheres at two different 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

Total enthalpy for an unsteady adiabatic inviscid flow

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

The exhaust nozzle's pressure ratio is a strong function of

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) 7×10^{-8} m^2/N

b) 5×10^{-10} m^2/N

c) 6×10^{-17} m^2/N

d) 0.05 m^2/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

Question Number : 65 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 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

Pressure variation for compressible fluid is maximum for which kind of process?

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

Sub-Section Id: 489994342
Question Shuffling Allowed : Yes

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

Which of the following is correct for a Fanno flow?

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 :

1. 1
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 1000c 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

In a shock tube, the driver gas should have

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

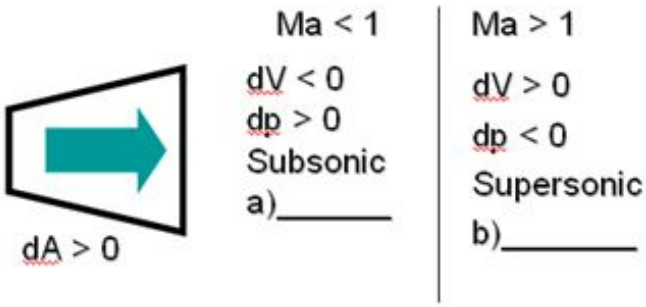
Options :

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

Question Number : 80 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 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 Mach line

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

Question Number : 85 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 oblique shock wave with a wave angle of $\beta = 80°$ is generated from a wedge angle of $\theta = 20°$. 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

2. 2
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

2. 2
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_o} and C_{m_α} are positive

b) C_{m_o} and C_{m_α} are negative

c) C_{m_o} is positive and C_{m_α} is negative

d) C_{m_o} 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

Which of the following factor is least/not desirable for fighter aircrafts?

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

2. 2
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

Which of the following elevator deflection will lead to minimum trim lift coefficient for stick fixed case?

a) $\delta_e = -10^0$

b) $\delta_e = -5^0$

c) $\delta_e = -0^0$

d) $\delta_e = 5^0$

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_α}(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

Sub-Section Number: 29
Sub-Section Id: 489994352
Question Shuffling Allowed : Yes

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 $(d\delta_t/dC_L) = 0$ 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

After dorsal fins are attached to an airplane the following improvement occurs

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

4. 4

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

Which of the following component contributes least to directional stability of an aircraft?

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

Which of the following control surface is generally not used to produce pitching motion of the aircraft?

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

If the weather-cock stability is very strong in comparison to the dihedral effect, then the dynamic motion due to disturbance will result in

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?

$\alpha_w = 10^0 \quad \varepsilon = 1^0 \quad i_t = -1^0 \quad i_w = 2^0 \quad \tau = 0.5 \quad \delta_e = 4^0$

a) 4^0

b) 6^0

c) 8^0

d) 10^0

Options :

1. 1
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

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

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 = 5m q = 0.4 rad/sec V= 100 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