Telangana State Council Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Aerospace Engineering 29th May 2023 Shift2
Subject Name :	Aerospace Engineering
Creation Date :	2023-05-29 18:29:05
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Actual Answer Key :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No

Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Aerospace Engineering

Group Number :	1
Group Id :	28393662
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	120
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics

Section Id :	283936174
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0

Question Number : 1 Question Id : 2839368801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The system $x + y + z = 3$, $x + 2y + 3z = 10$, and $x + 2y + \lambda z = \mu$ will have unique solution for

Options :

1. ✖ any value of λ and μ

2. ✖ $\lambda = 3$ and $\mu \neq 10$

3. ✖ $\lambda = 3$ and $\mu = 10$

4. ✔ $\lambda \neq 3$ and $\mu \in R$

Question Number : 2 Question Id : 2839368802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Given that the matrix $A = \begin{bmatrix} 5 & 2 & 1 \\ -2 & 1 & -1 \\ 2 & 2 & 4 \end{bmatrix}$ has an eigen vector $X = \begin{bmatrix} 1 & -1 & 1 \end{bmatrix}^T$ then the corresponding eigen value is

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 5

Question Number : 3 Question Id : 2839368803 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the function $u = sin^{-1}\left(\dfrac{x}{y}\right) + tan^{-1}\left(\dfrac{y}{x}\right)$ then the value of $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} =$

Options :

1. ✔ 0

2. ✖ 1

3. ✖ u

4. ✖ $2u$

Question Number : 4 Question Id : 2839368804 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If $\bar{f} = x^2 y^2 \bar{i} + y \bar{j}$ and the curve C is $y^2 = 4x$ in the xy-plane from $(0, 0)$ to $(4, 4)$ then $\int_C \bar{f} \cdot d\bar{r}$ is

Options :

1. ✖ 260

2. ✔ 264

3. ✖ 250

4. ✖ 320

Question Number : 5 Question Id : 2839368805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The angle between the normals to the surface $x^2 = yz$ at the points $(1, 2, 0)$ and $(-1, 2, 0)$ is

Options :

1. ✔ $\dfrac{\pi}{2}$

2. ✖ $\dfrac{\pi}{3}$

3. ✖ $\cos^{-1}\left(\dfrac{1}{5\sqrt{2}}\right)$

4. ✖ $\cos^{-1}\left(\dfrac{-1}{5\sqrt{2}}\right)$

Question Number : 6 Question Id : 2839368806 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An integrating factor of $(1 + y^2) + \left(x - e^{\tan^{-1}(y)} \right) \dfrac{dy}{dx} = 0$ is

Options :

1. ✖ e^{1+y^2}

2. ✔ $e^{\tan^{-1}(y)}$

3. ✖ $e^{1+\tan^{-1}y}$

4. ✖ $\dfrac{1}{1+y^2}$

Question Number : 7 Question Id : 2839368807 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If $\dfrac{\partial z}{\partial x} = p, \dfrac{\partial z}{\partial y} = q$, then the partial differential equation formed by eliminating

arbitrary constants from the relation $z = \sqrt{x+a} + \sqrt{y+b}$ is

Options :

1. ✖ $p + q = z$

2. ✗ $p + q = pqz$

3. ✔ $p + q = 2pqz$

4. ✗ $2pq = p + q$

Question Number : 8 Question Id : 2839368808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If $L\{f(t)\} = \bar{f}(s)$ then $L\{e^{-at} f(t)\}$ is

Options :

1. ✔ $\bar{f}(s+a); (s+a) > 0$

2. ✗ $e^{-as}\bar{f}(s+a); (s+a) > 0$

3. ✗ $\bar{f}(s-a); (s-a) > 0$

4. ✗ $e^{as}\bar{f}(s+a); (s+a) > 0$

Question Number : 9 Question Id : 2839368809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The order of the convergence of Newton-Raphson method is

Options :

1. ✗ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 10 Question Id : 2839368810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The value of the function in [0,1] at some points of x are given below

x	0	0.2	0.4	0.6	0.8	1
f(x)	0	0.04	0.16	0.36	0.64	1

Then the approximate value of $\int\limits_{0}^{1} f(x)\,dx$ by Simpson $\dfrac{1}{3}^{rd}$ rule is

Options :

1. ✖ 0.18

2. ✖ 0.08

3. ✖ 0.133

4. ✔ 0.28

Aerospace Engineering

Section Id :	283936175
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	110
Number of Questions to be attempted :	110
Section Marks :	110
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	283936175
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 11 Question Id : 2839368811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which wing section is most suitable for attaining high subsonic flight speeds?

Options :

1. ✖ laminar airfoil

2. ✖ thick airfoil

3. ✔ supercritical airfoils

4. ✖ diamond airfoil

Question Number : 12 Question Id : 2839368812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The standard pressure according to ISA is _____.

Options :

1. ✔ 1.01325×10^5 Pa

2. ✘ 1.225×10^5 Pa

3. ✘ 1.035×10^5 Pa

4. ✘ 1.775×10^5 Pa

Question Number : 13 Question Id : 2839368813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Absolute ceiling is the altitude at which the maximum rate of climb is _____

Options :

1. ✘ 1000 ft/min

2. ✘ 100 ft/min

3. ✘ 200 ft/min

4. ✔ zero

Question Number : 14 Question Id : 2839368814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is not a condition for attaining maximum range for a propeller-driven airplane?

Options :

1. ✖ carry lot of fuel

2. ✖ higher propeller efficiency

3. ✔ higher Specific Fuel Consumption

4. ✖ maximum L/D ratio

Question Number : 15 Question Id : 2839368815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For an airplane in level turn, the load factor is _____.

Options :

1. ✖ ≥ 1

2. ✔ > 1

3. ✖ $= 1$

4. ✖ < 1

Question Number : 16 Question Id : 2839368816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

At Manoeuvre point, which of the following is true?

Options :

1. ✖ Lift coefficient and Flight speed are maximum

2. ✖ Load factor and Flight speed are maximum

3. ✔ Load factor and Lift coefficient are maximum

4. ✖ Load factor and Wing loading are maximum

Question Number : 17 Question Id : 2839368817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following is true during take-off when compared to cruise?

Options :

1. ✔ induced drag is less during take-off

2. ✖ induced drag is more during take-off

3. ✖ induced drag during take-off is same as during cruise

4. ✖ induced drag is zero during take-off

Question Number : 18 Question Id : 2839368818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the weight of the airplane is doubled, the ground roll distance during take-off

Options :

1. ✖ increases 2 times

2. ✔ increases 4 times

3. ✖ decreases 2 times

4. ✖ decreases 4 times

Question Number : 19 Question Id : 2839368819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Density altitude is _____

Options :

1. ✖ same as pressure altitude

2. ✖ same as temperature altitude

3. ✖ pressure altitude corresponding to the sea-level temperature

4. ✔ pressure altitude corrected using ambient temperature

Question Number : 20 Question Id : 2839368820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Under what conditions Calibrated Airspeed is equal to Equivalent Airspeed?

Options :

1. ✖ airplane flying at Mach < 0.3

2. ✖ no instrument and position error

3. ✔ at sea level under ISA conditions

4. ✖ no altitude error

Question Number : 21 Question Id : 2839368821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

From the air data system, the Altimeter uses _____.

Options :

1. ✖ only stagnation pressure

2. ✖ both static and stagnation pressures

3. ✔ only static pressure

4. ✖ velocity

Question Number : 22 Question Id : 2839368822 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The ideal location for static pressure port on an aircraft is

Options :

1. ✖ nose of airplane

2. ✔ point where pressure coefficient = 0

3. ✖ along the leading edge of the wing

4. ✖ point where pressure coefficient = 1

Question Number : 23 Question Id : 2839368823 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Adverse yaw can be controlled by _____.

Options :

1. ✔ Rudder

2. ✖ Elevator

3. ✖ Trim tab

4. ✖ Dorsal fin

Question Number : 24 Question Id : 2839368824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a method of aerodynamic balancing?

Options :

1. ✖ Horn balance

2. ✖ Set back hinge

3. ✔ Dorsal fin

4. ✖ Frise aileron

Question Number : 25 Question Id : 2839368825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The pitching moment characteristics of an airplane is given by $C_m = 0.15 + 0.025\alpha$.
This airplane is

Options :
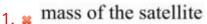
1. ✖ neutrally stable

2. ✔ statically unstable

3. ✖ statically stable

4. ✖ statically unstable but dynamically stable

Question Number : 26 Question Id : 2839368826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a free elevator case, if the angle of attack is increased, the elevator will

Options :

1. ✔ float upwards

2. ✖ floats downwards

3. ✖ remains same

4. ✖ coincides with center of gravity

Question Number : 27 Question Id : 2839368827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

At stick free condition, the elevator floating at an angle to trim is ensured by

Options :

1. ✖ Propeller slip stream

2. ✖ Pilot through control stick

3. ✖ downwash of the wing

4. ✔ Trim tab set at its angle to trim

Question Number : 28 Question Id : 2839368828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following is dynamically stable?

Options :

1. ✖ Undamped oscillation

2. ✔ Underdamped oscillation

3. ✖ Aperiodic oscillation

4. ✖ Divergent oscillation

Question Number : 29 Question Id : 2839368829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the reference frame is not rotating, then as the airplane rotates, the moments and products of inertia _____.

Options :

1. ✖ decreases as the rotation velocity increases

2. ✖ remains constant with time

3. ✖ becomes undefined

4. ✔ will vary with time

Question Number : 30 Question Id : 2839368830 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For an aircraft which has angular displacement in all axes (yaw ψ, pitch θ and roll ϕ), the gravitational force component along the z axis is _____.

Options :

1. ✖ $mg \sin \theta$

2. ✖ $- mg \sin \theta$

3. ✔ $mg \cos \theta \cos \phi$

4. ✖ $mg \cos \theta \sin \phi$

Question Number : 31 Question Id : 2839368831 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Comparing orbit equation and general equation of conic (in polar coordinates) shows that the semi-latus rectum P of the orbit depends only on the

Options :

1. ✖ mass of the satellite

2. ✖ specific mechanical energy of the satellite

3. ✖ position of the satellite

4. ✔ specific angular momentum of the satellite

Question Number : 32 Question Id : 2839368832 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following manoeuvres helps the communications and weather satellites in geostationary earth orbit to move to new locations above the equator?

Options :

1. ✖ Hohmann manoeuvre

2. ✔ Phasing manoeuvre

3. ✖ One tangent manoeuvre

4. ✖ Bi-elliptic Hohmann manoeuvre

Question Number : 33 Question Id : 2839368833 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

Correct Marks : 1 Wrong Marks : 0

How many impulses are required to perform a bi-elliptic orbital transfer manoeuvre?

Options :

1. ✖ 1

2. ✖ 2

3. ✖ 4

4. ✔ 3

Question Number : 34 Question Id : 2839368834 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The plane of the earth's revolution around the sun is called _____.

Options :

1. ✖ equatorial plane

2. ✔ ecliptic plane

3. ✖ elliptic plane

4. ✖ celestial plane

Question Number : 35 Question Id : 2839368835 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The time of flight of a projectile is given by _____ .

Options :

1. ✖ $\dfrac{u}{g}$

2. ✖ $\dfrac{u \sin \theta}{g}$

3. ✖ $\dfrac{2u}{g}$

4. ✔ $\dfrac{2u \sin \theta}{g}$

Question Number : 36 Question Id : 2839368836 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

At the point of boundary layer separation _____ .

Options :

1. ✖ the velocity gradient normal to the wall is negative

2. ✔ the shear stress is zero

3. ✖ the pressure gradient along the flow is zero

4. ✖ the velocity is negative

Question Number : 37 Question Id : 2839368837 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a steady flow at constant altitude, which of the following have a constant value along the streamline according to Bernoulli's equation?

Options :

1. ✖ Internal energy

2. ✖ Dynamic pressure

3. ✖ Static pressure

4. ✔ Stagnation pressure

Question Number : 38 Question Id : 2839368838 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true for a steady and Non-uniform flow?

Options :

1. ✖ Both Local acceleration and convective acceleration are non-zero

2. ✖ Both Local acceleration and convective acceleration are zero

3. ✔ Local acceleration is zero and convective acceleration is non-zero

4. ✖ Local acceleration is non-zero and convective acceleration is zero

Question Number : 39 Question Id : 2839368839 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The force acting on the fluid element at rest are namely

Options :

1. ✖ Gravity, shear and normal forces

2. ✔ Gravity and normal forces

3. ✖ Gravity and shear forces

4. ✖ Normal and shear forces

Question Number : 40 Question Id : 2839368840 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In an incompressible flow through a duct, if the area increases along the flow
direction, the pressure in the flow direction _____.

Options :

1. ✔ Increases

2. ✖ Decreases

3. ✖ Remains constant

4. ✖ Becomes zero

Question Number : 41 Question Id : 2839368841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The hydrostatic law states that rate of increase of pressure in a vertical direction is equal to _____.

Options :

1. ✖ Density of the fluid

2. ✖ Weight of the fluid

3. ✖ Volume of the fluid

4. ✔ Specific weight of the fluid

Question Number : 42 Question Id : 2839368842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Newton's law of viscosity is a relationship between _____.

Options :

1. ✔ Shear stress and rate of shear strain

2. ✖ Shear stress and velocity

3. ✖ Rate of shear strain and temperature

4. ✖ Stress is directly proportional to strain in a fluid

Question Number : 43 Question Id : 2839368843 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Velocity potential can be defined only when the flow is _____.

Options :

1. ✖ Incompressible

2. ✔ Irrotational

3. ✖ Rotational

4. ✖ Rotational and Viscous

Question Number : 44 Question Id : 2839368844 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Arrange the fuselage configuration according to the interference drag.

a) Bare fuselage

b) Fuselage with wind shield

c) Fuselage with cockpit and engine

d) Fuselage with wind shield and rear fairing for pilot

Options :

1. ✖ a > b > c > d

2. ✔ c > b > d > a

3. ✘ c > a > d > b

4. ✘ c > d > b > a

Question Number : 45 Question Id : 2839368845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The optimum vortex generator height for flow separation will be _____.

Options :

1. ✘ Equal to the height of Boundary layer thickness

2. ✘ Higher than the Boundary layer thickness

3. ✘ Equal to the thickness of airfoil

4. ✔ Lower than the boundary layer thickness

Question Number : 46 Question Id : 2839368846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the pitching moment at the aerodynamic centre of an air foil at 4° angle of attack is zero, what is the position of centre of pressure at 6° angle of attack when aerodynamic centre is at the quarter-chord point and chord length is represented by C.

Options :

1. ✖ 0.23C

2. ✖ 0.24C

3. ✔ 0.25C

4. ✖ 0.26C

Question Number : 47 Question Id : 2839368847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Consider a finite elliptic wing with an aspect ratio of 10. The wing is made of thin symmetrical airfoil sections with no geometric and aerodynamic twists. The lift slope of the wing is ____.

Options :

1. ✖ $3\pi/4$

2. ✔ $5\pi/3$

3. ✖ $5\pi/4$

4. ✖ $\pi/3$

Question Number : 48 Question Id : 2839368848 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If object's thickness to chord ratio increases, _____.

Options :

1. ✔ Pressure drag increases and Skin friction drag decreases

2. ✖ Pressure drag decreases and Skin friction drag increases

3. ✖ Pressure drag decreases and Skin friction drag decreases

4. ✖ Pressure drag increases and Skin friction drag increases

Question Number : 49 Question Id : 2839368849 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Decreasing the aspect ratio of a wing will _____.

Options :

1. ✖ reduce the induced drag

2. ✖ increase the lift

3. ✖ reduce the total drag

4. ✔ increase the induced drag

Question Number : 50 Question Id : 2839368850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Skin friction drag is more for _____.

Options :

1. ✔ The airfoil at zero angle of attack

2. ✘ The cylinder

3. ✘ The flat plate at high angle of attack

4. ✘ The airfoil at high angle of attack

Question Number : 51 Question Id : 2839368851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Two aerofoils of the same family are operating at the same angle of attack. The dimensions of one airfoil is twice as large as the other one. The ratio of the minimum pressure coefficient of the larger airfoil to the minimum pressure coefficient of the smaller airfoil is _____.

Options :

1. ✘ 4

2. ✘ 2

3. ✔

4. ✘ 0.5

Question Number : 52 Question Id : 2839368852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The design lift coefficient is measured when _____.

Options :

1. ✘ The angle of attack of the airfoil is zero

2. ✔ The flow direction at leading edge is tangent to the camber line

3. ✘ The airfoil is kept at a stalling angle of attack.

4. ✘ The flow direction at leading edge is normal to the camber line

Question Number : 53 Question Id : 2839368853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Consider the flat plate at an angle of attack in an incompressible, inviscid flow then

Options :

1. ✘ Drag = zero

2. ✔ Axial force = zero

3. ✘ Normal force = lift

4. ✖ Axial force = normal force

Question Number : 54 Question Id : 2839368854 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For an infinite wing at an angle of attack α, the total drag coefficient c_d is 0.05. The total drag coefficient C_D generated by the corresponding finite wing will be _____.

Options :

1. ✖ $C_D = 0.05$

2. ✖ $C_D < 0.05$

3. ✔ $C_D > 0.05$

4. ✖ $C_D = 0$

Question Number : 55 Question Id : 2839368855 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Advantage of Swept back wing over rectangular wing is _____.

Options :

1. ✖ Produce twice the lift

2. ✔ higher critical Mach number

3. ✖ Produce half the drag

4. ✖ lower critical Mach number

Question Number : 56 Question Id : 2839368856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following flow Mach number will have a smaller Mach wave angle?

Options :

1. ✔ 2.1

2. ✖ 1.2

3. ✖ 0.9

4. ✖ 0.8

Question Number : 57 Question Id : 2839368857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If $\theta > \theta_{max}$ for the fixed Mach number, the shock will be _____.

Options :

1. ✖ Straight normal shock

2. ✖ Straight oblique shock

3. ✔ Curved and detached oblique shock

4. ✖ Curved and attached oblique shock

Question Number : 58 Question Id : 2839368858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Decrease in static to stagnation pressure ratio will _____.

Options :

1. ✖ Increase the oblique shock strength at exit

2. ✖ Decrease the expansion wave strength at exit

3. ✖ Decrease the normal shock strength inside the duct

4. ✔ Increase the expansion wave strength at exit

Question Number : 59 Question Id : 2839368859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For Angle of attack – (alpha) and half wedge angle – (theta), the flow deflection angle behind the mid corner of diamond airfoil is

Options :

1. ✖ alpha + theta

2. ✖ alpha – theta

3. ✔ twice the theta

4. ✖ twice the alpha

Question Number : 60 Question Id : 2839368860 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Cooling of a frictionless calorically perfect gas with subsonic flow, results in _____.

Options :

1. ✖ Acceleration

2. ✔ Deceleration

3. ✖ No change in velocity

4. ✖ No change in specific enthalpy

Question Number : 61 Question Id : 2839368861 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Equation of right running Mach wave in method of characteristics is _____.

Options :

1. ✔ theta + v(M) = K

2. ✖ theta − v(M) = K

3. ✖ v(M) − theta = K

4. ✖ theta − Mach angle = K

Question Number : 62 Question Id : 2839368862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The linearized pressure coefficient of an airfoil kept in supersonic flow depends on

Options :

1. ✖ Airfoil thickness

2. ✖ Airfoil chord

3. ✖ Flow density

4. ✔ Angle of attack

Question Number : 63 Question Id : 2839368863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If the perturbation velocity is 2 m/sec and freestream velocity is 8 m/sec. Using small perturbation theory, the pressure coefficient in two-dimensional planar flows will be _____.

Options :

1. ✖ $^{-18}$

2. ✔ $-1/2$

3. ✖ $^{-41}$

4. ✖ $^{-8}$

Question Number : 64 Question Id : 2839368864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
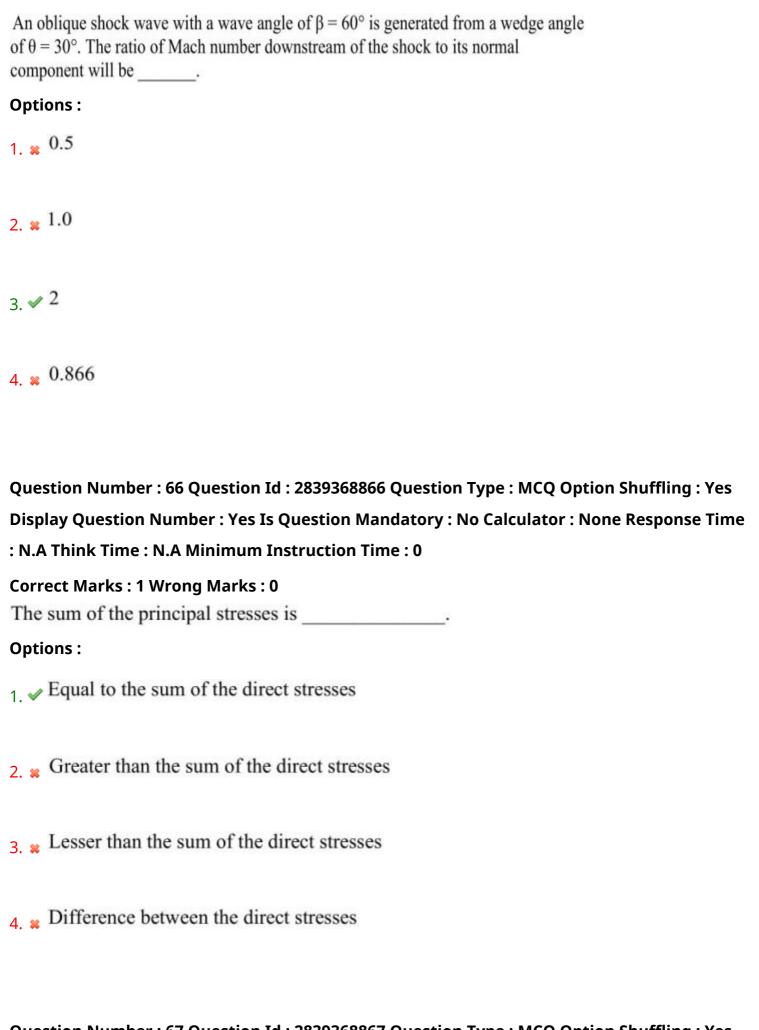
Correct Marks : 1 Wrong Marks : 0

The value of 4fL/D at choked end is _____.

Options :

1. ✖ 1.19

2. ✖ 1

3. ✖ 2

4. ✔ 0

Question Number : 65 Question Id : 2839368865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

An oblique shock wave with a wave angle of β = 60° is generated from a wedge angle of θ = 30°. The ratio of Mach number downstream of the shock to its normal component will be _____.

Options :

1. ✖ 0.5

2. ✖ 1.0

3. ✔ 2

4. ✖ 0.866

Question Number : 66 Question Id : 2839368866 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The sum of the principal stresses is _____.

Options :

1. ✔ Equal to the sum of the direct stresses

2. ✖ Greater than the sum of the direct stresses

3. ✖ Lesser than the sum of the direct stresses

4. ✖ Difference between the direct stresses

Question Number : 67 Question Id : 2839368867 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

Correct Marks : 1 Wrong Marks : 0

The ratio of modulus of rigidity to modulus of elasticity for a Poisson's ratio of 0.5 would be _____.

Options :

1. ✖ 0.5

2. ✖ 1.0

3. ✔ 0.4

4. ✖ 0.3

Question Number : 68 Question Id : 2839368868 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The normal stress on an oblique plane at an angle theta to the cross-section of a body will be maximum when theta (in degrees) is equal to _____.

Options :

1. ✔ 0

2. ✖ 90

3. ✖ 45

4. ✖ 35

Question Number : 69 Question Id : 2839368869 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For most of the brittle materials, the ultimate strength in compression is much larger than the ultimate strength in tension. This is mainly due to _____.

Options :

1. ✖ Severity of tensile stress as compared to compressive stress

2. ✖ Necking in tension

3. ✖ Non-linearity of stress-strain diagram

4. ✔ Presence of flaws and microscopic cracks or cavities

Question Number : 70 Question Id : 2839368870 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In case of bi-axial state of normal stresses, the normal stress on 45° plane is equal to _____.

Options :

1. ✖ Sum of normal stresses

2. ✖ Difference of normal stresses

3. ✔ Half the sum of normal stresses

4. ✖ Half the difference of normal stresses

Question Number : 71 Question Id : 2839368871 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The buckling load will be maximum for a column, if _____.

Options :

1. ✖ One end of the column is clamped and other end is free

2. ✔ Both ends of the column are clamped

3. ✖ Both ends of the column are hinged

4. ✖ One end of the column is hinged and other end is free

Question Number : 72 Question Id : 2839368872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Choose the wrong statement

Options :

1. ✖ Column is a vertical member of a structure which carries an axial compressive load

2. ✖ The ratio of length of a column to its minimum radius of gyration is called slenderness ratio

3. ✖ A column tends to buckle in the direction of the minimum moment of inertia

4. ✔ The equivalent length of a column with one end fixed and other end is free is half of its actual length

Question Number : 73 Question Id : 2839368873 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For a two-dimensional stress system, according to maximum strain energy theory, when principal stresses (σ) in two directions are equal and tensile, Poisson's ratio as 0.5, the maximum permissible stress is

Options :

1. ✔ σ

2. ✖ $\dfrac{\sigma}{2}$

3. ✖ Zero

4. ✖ Infinite

Question Number : 74 Question Id : 2839368874 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The maximum shear stress or maximum shear strain energy theories should be used for _____ .

Options :

1. ✖ Brittle materials

2. ✔ Ductile materials

3. ✖ Malleable materials

4. ✖ Brittle and malleable materials

Question Number : 75 Question Id : 2839368875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If compressive yield stress and tensile yield stress are equivalent, then the region of safety from maximum principal stress theory is of which shape?

Options :

1. ✖ Rectangle

2. ✖ Circle

3. ✖ Ellipse

4. ✔ Square

Question Number : 76 Question Id : 2839368876 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
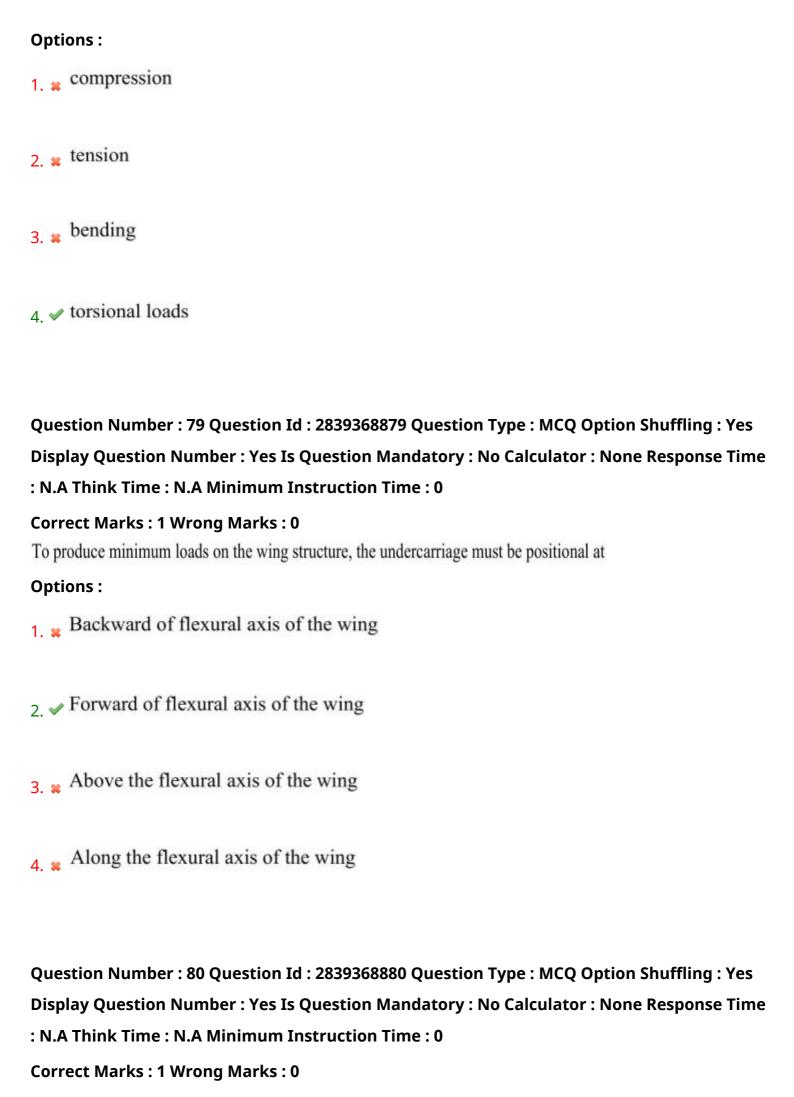
Correct Marks : 1 Wrong Marks : 0

Kevlar composites are poor in

Options :

1. ✖ Tension

2. ✖ Shear

3. ✔ Compression

4. ✖ Bending

Question Number : 77 Question Id : 2839368877 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

When compared with Glass Reinforced plastics, Carbon-Fiber-Reinforced Plastics has a highest modulus of the order of

Options :

1. ✔ Three

2. ✖ Two

3. ✖ 0.5

4. ✖ Four

Question Number : 78 Question Id : 2839368878 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The role of spar webs is to resist shear and _____.

Options :

1. ✖ compression

2. ✖ tension

3. ✖ bending

4. ✔ torsional loads

Question Number : 79 Question Id : 2839368879 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

To produce minimum loads on the wing structure, the undercarriage must be positional at

Options :

1. ✖ Backward of flexural axis of the wing

2. ✔ Forward of flexural axis of the wing

3. ✖ Above the flexural axis of the wing

4. ✖ Along the flexural axis of the wing

Question Number : 80 Question Id : 2839368880 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The purpose of wing ribs is to resist the

Options :

1. ✓ Buckling loads

2. ✗ Bending loads

3. ✗ Compressive loads

4. ✗ Direct tensile loads

Question Number : 81 Question Id : 2839368881 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A thin-walled square section of side 1m and thickness 1mm is subjected to a torque 'T' (Nm), the shear flow 'q' (N/m) is _____.

Options :

1. ✗ $\dfrac{T}{4}$

2. ✗ $\dfrac{T}{6}$

3. ✓ $\dfrac{T}{2}$

4. ✗ $\dfrac{T}{8}$

Question Number : 82 Question Id : 2839368882 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

A line connecting the shear centre of all cross-sections is called as _____.

Options :

1. ✖ Neutral axis

2. ✔ An elastic axis

3. ✖ Principal axis

4. ✖ Shear axis

Question Number : 83 Question Id : 2839368883 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The product moment of inertia for a square cross section of sides 1m is _____.

Options :

1. ✖ $\dfrac{1}{8}$

2. ✖ $\dfrac{1}{6}$

3. ✖ $\dfrac{1}{12}$

4. ✔ 0

Question Number : 84 Question Id : 2839368884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The shear stress τ_{xy} in terms of stress function Ø considering body forces is given by

Options :

1. ✖ $\tau_{xy} = \dfrac{\partial^2 Ø}{\partial x \partial y}$

2. ✔ $\tau_{xy} = -\dfrac{\partial^2 Ø}{\partial x \partial y}$

3. ✖ $\tau_{xy} = \dfrac{\partial^2 Ø}{\partial x^2}$

4. ✖ $\tau_{xy} = \dfrac{\partial^2 Ø}{\partial y^2}$

Question Number : 85 Question Id : 2839368885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the solution of polynomial of second degree, with respect of entire body all the stress components are

Options :

1. ✖ Varying

2. ✖ Linear

3. ✗ Parabolic

4. ✔ Constant

Question Number : 86 Question Id : 2839368886 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The 2-D compatibility equation is given by _____.

Options :

1. ✔ $\dfrac{\partial^2 \varepsilon_x}{\partial y^2} + \dfrac{\partial^2 \varepsilon_y}{\partial x^2} = \dfrac{\partial^2 \gamma_{xy}}{\partial x \partial y}$

2. ✗ $\dfrac{\partial^2 \varepsilon_x}{\partial y^2} - \dfrac{\partial^2 \varepsilon_y}{\partial x^2} = \dfrac{\partial^2 \gamma_{xy}}{\partial x \partial y}$

3. ✗ $\dfrac{\partial^2 \varepsilon_x}{\partial x^2} + \dfrac{\partial^2 \varepsilon_y}{\partial y^2} = \dfrac{\partial^2 \gamma_{xy}}{\partial x \partial y}$

4. ✗ $\dfrac{\partial^2 \varepsilon_x}{\partial x^2} - \dfrac{\partial^2 \varepsilon_y}{\partial y^2} = \dfrac{\partial^2 \gamma_{xy}}{\partial x \partial y}$

Question Number : 87 Question Id : 2839368887 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For forced damped vibration system, the vibration isolation is possible only when
_____.

Options :

1. ✗

$$\frac{\omega}{\omega_n} = 1$$

2. ✗ $\frac{\omega}{\omega_n} < 1$

3. ✓ $\frac{\omega}{\omega_n} > \sqrt{2}$

4. ✗ $\frac{\omega}{\omega_n} < \sqrt{2}$

Question Number : 88 Question Id : 2839368888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The natural frequency of a simply supported beam of length L with mass M at its centre, flexural rigidity EI and negligible beam mass is _____.

Options :

1. ✓ $\frac{1}{2\pi}\sqrt{\frac{48EI}{ML^3}}$

2. ✗ $\frac{1}{2\pi}\sqrt{\frac{3EI}{ML^3}}$

3. ✗ $\frac{1}{2\pi}\sqrt{\frac{EI}{ML^3}}$

4. ✗ $\frac{1}{2\pi}\sqrt{\frac{8E}{ML^3}}$

Question Number : 89 Question Id : 2839368889 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Work done in a quasi-static process:

Options :

1. ✔ depends on the path followed

2. ✖ independent of the path followed

3. ✖ depends only on the initial state

4. ✖ depends only on the final state

Question Number : 90 Question Id : 2839368890 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

To Produce network in a complete cycle, a heat engine has to exchange heat with

Options :

1. ✖ One energy reservoir at one temperature

2. ✖ One energy reservoir at two different temperatures

3. ✔ Two energy reservoir at two different temperatures

4. ✖ Two energy reservoir at one temperatures

Question Number : 91 Question Id : 2839368891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The proportion of Pressure thrust in total thrust is in range of _____.

Options :

1. ✖ (30-60) %

2. ✖ (20-50) %

3. ✔ (10-30) %

4. ✖ (0-10) %

Question Number : 92 Question Id : 2839368892 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Pick up the correct statement:

Options :

1. ✖ Gas turbine uses low air-fuel ratio to economize on fuel

2. ✔ Gas turbine uses high air-fuel ratio to reduce gas temperature

3. ✖ Gas turbine uses low air-fuel ratio to develop the high thrust required

4. ✖ Gas turbine uses low fuel-air ratio to develop the high thrust required

Question Number : 93 Question Id : 2839368893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A turbofan engine that derives most of its thrust from the jet engine core efflux is referred to as:

Options :

1. ✓ low bypass engine

2. ✗ High bypass engine

3. ✗ bypass engine

4. ✗ fan engine

Question Number : 94 Question Id : 2839368894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

To maximize the work output at turbine, the specific volume of working fluid should be:

Options :

1. ✗ As small as possible

2. ✓ As large as possible

3. ✗ Constant throughout the cycle

4. ✗ Infinite

Question Number : 95 Question Id : 2839368895 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Mixing of fuel-air, ignition and flame stabilization are more pertinent issues in _____.

Options :

1. ✖ Turbojet

2. ✖ Ramjet

3. ✖ Rocket

4. ✔ Scramjet

Question Number : 96 Question Id : 2839368896 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

With increasing pressure ratio for constant stage efficiency, the entropic efficiency of compressor _____.

Options :

1. ✔ Reduces

2. ✖ Increases

3. ✖ no change

4. ✖ Becomes 100%

Question Number : 97 Question Id : 2839368897 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In an axial flow compressor, the ratio of pressure in the rotor blades to the pressure rise in the compressor in one stage is known as _____.

Options :

1. ✖ Work factor

2. ✖ Slip factor

3. ✔ Degree of reaction

4. ✖ Pressure coefficient

Question Number : 98 Question Id : 2839368898 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Compression efficiency is compared against _____.

Options :

1. ✖ Ideal compression

2. ✖ adiabatic compression

3. ✖ Isentropic compression

4. ✔ Isothermal compression

Question Number : 99 Question Id : 2839368899 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which one of the following compressors has the maximum RPM?

Options :

1. ✔ Axial flow compressor

2. ✖ Centrifugal compressor

3. ✖ Screw Compressor

4. ✖ Centripetal compressor

Question Number : 100 Question Id : 2839368900 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

: N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

For axial flow compressor, reaction ratio in terms of rotor blade at inlet (β_1), at outlet (β_2) and flow coefficient (θ) is _____.

Options :

1. ✖ $2\theta(tan\beta_1 - tan\beta_2)$

2. ✗ $2\theta(tan\beta_1 + tan\beta_2)$

3. ✗ $\frac{\theta}{2}(tan\beta_1 - tan\beta_2)$

4. ✓ $\frac{\theta}{2}(tan\beta_1 + tan\beta_2)$

Question Number : 101 Question Id : 2839368901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The radial flow and axial flow turbines are classified on the basis of _____.

Options :

1. ✗ flow velocity.

2. ✗ flow pressure.

3. ✗ pressure ratios.

4. ✓ flow direction.

Question Number : 102 Question Id : 2839368902 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In the impulse turbine, the entire energy is first converted into _____.

Options :

1.

✔ Kinetic Energy.

2. ✖ Potential Energy.

3. ✖ Vibrational Energy.

4. ✖ Pressure rise.

Question Number : 103 Question Id : 2839368903 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The blade-loading coefficient is used to express _____.

Options :

1. ✖ pressure rise of the stage.

2. ✖ flow speed of the stage.

3. ✔ work capacity of the stage.

4. ✖ enthalpy of the stage.

Question Number : 104 Question Id : 2839368904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Forward leaning blades are not used as a centrifugal compressor rotor (impeller) due to inherent _____.

Options :

1. ✖ static instability

2. ✖ system instability

3. ✔ dynamic instability

4. ✖ structural instability

Question Number : 105 Question Id : 2839368905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The slip factor is approximately related to the _____.

Options :

1. ✔ number of blades of the impeller.

2. ✖ flow velocity.

3. ✖ pressure.

4. ✖ type of vanes.

Question Number : 106 Question Id : 2839368906 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Inducer is the impeller entrance section where _____.

Options :

1. ✗ the radial motion of the fluid is changed in the tangential direction.

2. ✗ the lateral motion of the fluid is changed in the centrifugal direction.

3. ✓ the tangential motion of the fluid is changed in the radial direction.

4. ✗ the fluid motion is blocked.

Question Number : 107 Question Id : 2839368907 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

The Centrifugal compressors develop _____.

Options :

1. ✗ high flow velocity.

2. ✓ higher per stage pressure ratios.

3. ✗ low flow velocity.

4. ✗ lower per stage pressure ratios.

Question Number : 108 Question Id : 2839368908 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Without inducers, the rotor operation would suffer from _____.

Options :

1. ✖ flow redirection.

2. ✖ high noise.

3. ✖ the vortices formation.

4. ✔ flow separation and high noise.

Question Number : 109 Question Id : 2839368909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Maximum Thrust condition in rockets is_____.

Options :

1. ✖ $P_e = 0$

2. ✖ $P_e < P_a$

3. ✔ $P_e = P_a$

4. ✖ $P_e > P_a$

Question Number : 110 Question Id : 2839368910 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time

Correct Marks : 1 Wrong Marks : 0

What will happen to thrust and specific impulse as the rocket is propelled to higher altitudes:

Options :

1. ✖ Thrust decreases, specific impulse increases

2. ✔ Thrust increases, specific impulse increases

3. ✖ Thrust decreases, specific impulse decreases

4. ✖ Thrust increases, specific impulse decreases

Question Number : 111 Question Id : 2839368911 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Under practical conditions, if pressure ratio increases then specific impulse:

Options :

1. ✔ Increases

2. ✖ Decreases

3. ✖ Remains constant

4. ✖ Becomes Zero

Question Number : 112 Question Id : 2839368912 Question Type : MCQ Option Shuffling : Yes

How does the total thrust vary with an extendable nozzle?

Options :

1. ✖ First decreases, then increase

2. ✖ Keeps on increasing

3. ✔ First increases, then decrease

4. ✖ Keeps on decreasing

The Divergence factor is given by:

Options :

1. ✖ $0.5 \, (1 + \sin\alpha)$

2. ✔ $0.5 \, (1 + \cos\alpha)$

3. ✖ $0.5 \, (1 + \tan\alpha)$

4. ✖ $0.5 \, (1 - \sin\alpha)$

Question Number : 114 Question Id : 2839368914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

During Powered flight, the velocity loss due to gravity is given by:

Options :

1. ✖ gt^2

2. ✖ $\dfrac{g}{t^2}$

3. ✖ $g - t^2$

4. ✔ $\dfrac{gt^2}{2}$

Question Number : 115 Question Id : 2839368915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

How are Specific Propellant Consumption (SPC) and Characteristic velocity (C_c) related?

Options :

1. ✖ $SPC = 1/ C_c$

2. ✔ $SPC = C_c$

3. ✖ $SPC = 1 + C_c$

4. ✖ $SPC = 1 - C_c$

Question Number : 116 Question Id : 2839368916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Clustering in rockets is done by:

Options :

1. ✖ Alternate linking of Igniters.

2. ✖ Linking Igniters in different stages

3. ✖ Cross-linking of Igniters

4. ✔ Parallel linking of Igniters

Question Number : 117 Question Id : 2839368917 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Multi-staging in rockets leads to

Options :

1. ✖ Loss of efficiency

2. ✖ Loss of Thrust

3. ✔ Integration complexities

4. ✖ Excessive drag

Question Number : 118 Question Id : 2839368918 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which among is not an assumption in vertical flight model?

Options :

1. ✔ Constant specific impulse

2. ✖ Constant acceleration of rocket

3. ✖ Constant mass of rocket

4. ✖ Negligible atmospheric drag

Question Number : 119 Question Id : 2839368919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Characteristic velocity (C_c) and Discharge coefficient (C_D) are related as:

Options :

1. ✖ $C_c = C_D \times I_{sp}$

2. ✖ $C_c = C_D / I_{sp}$

3. ✖ $C_c = I_{sp} / C_D$

4.

✔ $C_c = 1 / C_D$

Question Number : 120 Question Id : 2839368920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In what level, Rocket equation is better than vertical flight model in giving performance?

Options :

1. ✖ Average

2. ✖ Instantaneous

3. ✔ Portable

4. ✖ Designed