Telangana State Council Higher Education

Notations :

1.0ptions shown in green color and with icon are correct.

2.0ptions shown in red color and with icon are incorrect.

Question Paper Name :	2022-08-02 17:21:07
Subject Name :	120
Creation Date :	120
Duration :	Yes
Total Marks :	None
Display Marks:	No
Calculator :	No
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	Yes
Show Watermark on Console? :	No
Highlighter :	Yes
Auto Save on Console?	No
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Aerospace Engineering 2nd Aug 2022 Shift 2

Aerospace Engineering

Aerospace Engineering

Group Number :	
Group Id :	34058044
Group Maximum Duration :	
Group Minimum Duration :	120

Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	
Group Marks :	120
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

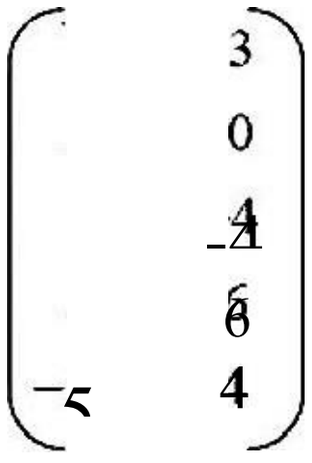
Mathematics

Section Id :	34058080
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 :	
Sub-Section Number :	1
Sub-Section Id :	34058080
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 3405805161 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 : O

Correct Marks : 1 Wrong Marks : O

The number of independent rows m the matlix



1 —2

2 1 is

3 1

5 1

—2

Options :

1

34058020641.

2

34058020642.

34058020643.

34058020644. 4

Question Number : 2 Question Id : 3405805162 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 : O
Correct Marks : 1 Wrong Marks : O

The number of solutions of the system: x + y + z = 0, 2x + y + z = I ,
3x + 2y—z= 10, x —y—2z = 9 is

Options :

34058020645.

34058020646. 8 2

34058020647. 3

34058020648. 00

Question Number : 3 Question Id : 3405805163 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 : O
Correct Marks : 1 Wrong Marks : O

If $= \begin{bmatrix} -2 & 1 & 1 \\ A1 & -2 & 1 \\ 1 & 1 & -2 \end{bmatrix}$, then $A^3 + 6A^2 = kA$ where k =

Options :
34058020649.

34058020650.

34058020651. e 9

34058020652. 12

Question Number : 4 Question Id : 3405805164 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 : O
Correct Marks : 1 Wrong Marks : O

The number of clitical points of $f(x) = 3x - 4\cos 2x$ is

Options :
34058020653.

34058020654. 1

34058020655. 2

34058020656. 3

Question Number : 5 Question Id : 3405805165 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 : O
Correct Marks : 1 Wrong Marks : O

The domain of the real function

$f(x) = \frac{x^2+1}{\log\sqrt{|x^2-1|}}$ is

Options :

34058020657.

34058020658. 8,

34058020659.$(-1, 1)_{-0)}$

34058020660.✖ $(-1, 1)$

Question Number : 6 Question Id : 3405805166 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 : O
Correct Marks : 1 Wrong Marks : O

The ftnction f(x) = cosec x is continuous on

Options :

R — {nTC : n€Z}

34058020661.

Q -{n1t:neZ }

34058020662.

{mt:n€Z}

34058020663. 8

Q

34058020664.

Question Number : 7 Question Id : 3405805167 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 : O

Correct Marks : 1 Wrong Marks : O

df

Iff(x, y) = x y + xy , x = t cost, y = sintthen —at t is

dt 2

Options :

34058020665. 2

2

34058020666.

34058020667.

¯1

34058020668.

Question Number : 8 Question Id : 3405805168 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 : O

Correct Marks : 1 Wrong Marks : O

The directional derivative off(x, y) = 2x - 3xy + 4y– 6x + 3- 4 in the direction of 7+3 at (3, 3) is

Options :

34058020669. ✖ $-8\sqrt{2}$

34058020670.

34058020671. ✖ $-7\sqrt{2}$

34058020672. ✖ $8\sqrt{2}$

Question Number : 9 Question Id : 3405805169 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 : O

Correct Marks : 1 Wrong Marks : O

Ifthe panicular integral of y" + y= I + x is Yb=a+ bx+cx thena+b+c=

Options :

34058020673.

34058020674. 8 2

34058020675.

34058020676.

Question Number : 10 Question Id : 3405805170 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 : O

Correct Marks : 1 Wrong Marks : O

The solution of $y'' - y = 0$ satisfying $y(0) = 1 = y'(0)$ is

Options :

34058020677. ✗ $y = e^{2x}$

34058020678. e^{-x}

34058020679. ✓ $y = e^{x}$

34058020680. ✗ $y = x + 1$

Aerospace Engineering

Section Id :	34058081
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 :	
Sub-Section Number :	1
Sub-Section Id :	34058081

Question Shuffling Allowed : Yes

Question Number : 11 Question Id : 3405805171 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 : O

Correct Marks : 1 Wrong Marks : O

For the flow past an airfoil at an angle of attack, whicll of die following statements

is con•ect

Options :

Resultant of nonnal force and axial force is equal to lift 34058020681.

Resultant of nonnal force and axial force is equal to drag 34058020682. 8

Resultant of nonnal force and axial force is equal to resultant of lift and drag 34058020683.

Nonnal force is equal to resultant of lift and drag 34058020684.

Question Number : 12 Question Id : 3405805172 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 : O

Correct Marks : 1 Wrong Marks : O

For an aircraft moving at 100 m/s under standard afino.spheric conditions at sea

level, the freestream dynamic pressure is

Options :

6.125 kPa 34058020685.

s: 0.6125 kPa 34058020686.

12.25 kPa 34058020687.
8

1.225 kPa
34058020688. 8

Question Number : 13 Question Id : 3405805173 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 : O
Correct Marks : 1 Wrong Marks : O

The location of center of pressure measured from the leading edge for an airfoil at an angle of attack having = 0.9 and cm,c/4 = -0.09 (pitch-up moment is considered positive) is

Options :

0.15c
34058020689.

0.25c 34058020690.

0.35c 34058020691.

0.45c
34058020692.

Question Number : 14 Question Id : 3405805174 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 : O
Correct Marks : 1 Wrong Marks : O

For the flow fields over two different bodies to be dynamically similar, which of the following conditions is necessary

Options :

34058020693. The bodies are geometlically similar

The bodies are identical is size and shape

34058020694.

The freestream velocity has to be the same for both flow fields

34058020695. 8

The freestream pressure has to be the same for both flow fields

34058020696.

Question Number : 15 Question Id : 3405805175 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 : O
Correct Marks : 1 Wrong Marks : O

Consider an aircraft flying with a velocity of 250 IWs at an altitude where the

temperature is 200K. The Mach number of flie aircraft is

Options :

1.25

34058020697.

34058020698. 8 1.13

1.00
34058020699.

34058020700. 0.88

Question Number : 16 Question Id : 3405805176 Question Type : MCQ Option Shuffling : Yes

Question Number : :

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

Correct Marks : 1 Wrong Marks : O

The stall velocity of an aircraft having a conventional configuration is independent of

Options :

34058020701. Angle of attack

L, max

34058020702. 8

34058020703. 8 Altitude

D,min

34058020704.

Question Number : 17 Question Id : 3405805177 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 : O

Correct Marks : 1 Wrong Marks : O

The Bernoulli's equation is not valid for

Options :

Inviscid flow

34058020705. 8

Incompressible flow

34058020706.

Steady flow

34058020707. 8

Viscous flow

34058020708.

18

Display Question

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

Question Number : Question Id : 3405805180 Question Type : MCQ Option Shuffling : Yes

Number : Yes Is Question Mandatory : No Calculator : None

Response Time

Correct Marks : 1 Wrong Marks : O

For an open-circuit low-speed wind tunnel

Options :

34058020709. The length of diffuser is greater than that of the nozzle

✖ The length of diffuser is lesser than that of the nozzle

34058020710.

The length of diffuser is equal to that of the nozzle

34058020711.

✖ The length of diffuser is equal to that of the test section

34058020712.

Question Number : 19 Question Id : 3405805179 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 : O

Correct Marks : 1 Wrong Marks : O

Pitot-static probe is used for measuring_____in a flow

Options :

34058020713. ✖

Velocity

34058020714.

Question Number : Question Id : 3405805180 Question Type : MCQ Option Shuffling : Yes

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

Angular velocity

Temperature

20

34058020715.

Display Question

34058020716. Density

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

Correct Marks : 1 Wrong Marks : O

Considering inviscid and incompressible flow, the supqosition of a source and uniform mean flow will result in flow over

Options :

8 A Rankine oval

34058020717.

34058020718. A semi-infinite body

A cylinder 34058020719.

8

34058020720. s: An Ellipse

Question Number : 21 Question Id : 3405805181 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 : O

Correct Marks : 1 Wrong Marks : O

For the mviscid, incompressible flow over a cylinder, the minimum value of Cp on the cylinder is

Question Number : Question Id : 3405805180 Question Type : MCQ Option Shuffling : Yes

Number : Yes Is Question Mandatory : No Calculator : None

Response Time

Options :

34058020721. ✘ -

34058020722. -

34058020723. -

34058020724.

Question Id : 3405805182 Question Type MCQ Option Shuffling : Yes

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

-4

Question Number : 22 :

Display Question

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

Correct Marks : 1 Wrong Marks : O

Which of the following statements about NACA 2418 ailfoil is not con•ect

Options :

34058020725. It is a symmetrical airfoil

8 The maximum thiclmess of the airfoil is 18 % of the chord

34058020726.

8 The maximum camber is 2 % of the chord

34058020727.

34058020728. s: The maximum camber is located at 0.4c from the leading edge

Question Number : 23 Question Id : 3405805183 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 : O
Correct Marks : 1 Wrong Marks : O
The sum of skin fiiction drag and fonn drag due to flow separation is called

Options :

34058020729. 8 Wave drag

Induced drag 34058020730.

Parasitic drag

34058020731.

Fonn drag

Question Number : 24 Question Id : 3405805184 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 : O
Correct Marks : 1 Wrong Marks : O
Aerodynamic center of an airfoil is defined as that point about which

Options :

34058020733. ✖

Drag is acting

34058020734. 8

34058020735. 8 Aerodynamic moment is zero Lift is

Aerodynamic moment is independent of the angle of attack acting

34058020736.

Question Number : 25 Question Id : 3405805185 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 : O
Correct Marks : 1 Wrong Marks : O

The classical thin airfoil theolY does not predict the

Options :

34058020737. ✖ Slope of versus angle of attack culve

34058020738. Angle of attack conesponding to zero lift for a symmetric airfoil Aerodynamic center and center of pressure of an airfoil

✖

Stall characteristics of an airfoil

34058020740.

Question Number : 26 Question Id : 3405805186 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 : O
Correct Marks : 1 Wrong Marks : O
The thin airfoil theoty predicts the aerodynamic center for a cambered airfoil 111 incompressible flow to be at the

Options :

Quaner-chord of the airfoil
34058020741.

Leading edge of the ailfoil
34058020742.

Trailing edge of the airfoil
34058020743. 8

Mid-chord of the ailfoil
34058020744. ✖

Question Number : 27 Question Id : 3405805187 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 : O
Correct Marks : 1 Wrong Marks : O ullich of the following statements about high-lift devices is false

Options :

High lift devices increases CL,mar
34058020745.

34058020746. 8

High lift devices are operated cluing take-off

34058020747. 8

High lift devices are operated dilling landing

High lift devices are operated during Cluise

34058020748.

Question Number : 28 Question Id : 3405805188 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 : O
Correct Marks : 1 Wrong Marks : O

Induced drag is produced due to

Options :

34058020749. 8

Infinite size of wing

34058020750.

Shear stress acting on the wing

Flow separation

34058020751.

Drag produced by the downwash 34058020752.

Question Number : 29 Question Id : 3405805189 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 : O
Correct Marks : 1 Wrong Marks : O

Prandtl 's classical lifting-line theolY predicts that for an elliptical circulation distlibution the downwash is

Options :

zero

34058020753. s:

constant along the span

34058020754.

linearly increases along the span

34058020755.

linearly decreases along the span

34058020756. 8

Question Number : 30 Question Id : 3405805190 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 : O

Correct Marks : 1 Wrong Marks : O

Prandtl's classical lifting-line theolY predicts that

Options :

34058020757. ✔ $C_{D,i} = \frac{C_L^2}{\pi eAR}$

$C_{D,i} = \frac{C_L^3}{\pi eAR}$

34058020758. 8

34058020759. 8 $C_{D,i} = \frac{C_L^2}{\pi e}$

34058020760. ✘ $C_{D,i} = \frac{ARCE}{Ite}$

Question Number : 31 Question Id : 3405805191 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 : O
Correct Marks : 1 Wrong Marks : O

For isentropic flow, the pressure and temperature at stations I and 2 are related as

Options :

34058020761. Pi s:

34058020762. ✗ $\frac{p_2}{p_1} = \frac{T_1}{T_2}$

34058020763. ✓ $\frac{p_2}{p_1} = \left(\frac{T_2}{T_1}\right)^{\gamma/(\gamma-1)}$

34058020764. $\frac{p_2}{p_1} = \left(\frac{T_1}{T_2}\right)^{\gamma/(\gamma-1)}$

Question Number : 32 Question Id : 3405805192 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 : O
Correct Marks : 1 Wrong Marks : O

The tllennodynamic quantity whicll remains constant across a sli0Ck wave is

Options :

34058020765. gnation temperature

34058020766. ✗ Stagnation pressure

Entropy

34058020767.

34058020768. Density

Question Number : 33 Question Id : 3405805193 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 : O

Correct Marks : 1 Wrong Marks : O

Wiicll ofthe following statements about speed of sound in a calorically perfect

gas is wrong

Options :

Speed of sound depends on temperature

34058020769.

Speed of sound depends on molecular weight of the gas

34058020770. 8

Speed of sound is dependent on ratio of specific heats

34058020771.

34058020772. Speed of sound is independent of temperature and molecular weight

Question Number : 34 Question Id : 3405805194 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 : O

Correct Marks : 1 Wrong Marks : O

The product of the charactefistic Mach numbers before and after the nonnal shock is

Options :

34058020773.

34058020774. 8 2

34058020775. e

34058020776.

Question Number : 35 Question Id : 3405805195 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 : O

Correct Marks : 1 Wrong Marks : O

For a nonnal shock. limM1*00M_2=

Options :

34058020777.

34058020778. 8 1

34058020779. ✔ $\sqrt{\frac{\gamma-1}{2\gamma}}$

34058020780. ✖ $\sqrt{\frac{2\gamma}{\gamma-1}}$

Question Number : 36 Question Id : 3405805196 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 : O

Correct Marks : 1 Wrong Marks : O

The Mach angle is related to the Mach number as

Options :

• —1M sm

34058020781. s: 2

. 1 sm

34058020782.

cos-__

2

34058020783.

cos __

34058020784.

Question Number : 37 Question Id : 3405805197 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 : O

Correct Marks : 1 Wrong Marks : O

For an oblique shock, the shock-wave angle conesponding to strong sli0Ck is

Options :

34058020785. 8

Equal to that of weak shock

Greater than that of weak shock

34058020786.

34058020787.

Less than that of weak shock

Independent of Mach number

34058020788.

Question Number : 38 Question Id : 3405805198 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 : O

Correct Marks : 1 Wrong Marks : O

Consider the shock wave angle for a cone in relation to that of a wedge for the same

llalf angle and Mach number. WIIich of the following statements is con•ect

Options :

Both will have the same shock wave angle

34058020789. 8

34058020790. s: The shock wave angle for the cone will be higher

The shock wave angle for the wedge will be higher

34058020791.

The shock wave angle is independent of the half angle of cone or wedge

34058020792.

Question Number : 39 Question Id : 3405805199 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 : O

Correct Marks : 1 Wrong Marks : O

WIIich of the following statements about Prandtl-Meyer expansion waves is wrong

Options :

34058020793. s: The flow across a Prandtl-Meyer expansion wave is isentropic

The Mach number of the flow across Prandtl-Meyer expansion wave mcreases

34058020794.

The flow direction across a Prandtl-Meyer expansion wave remains same

34058020795.

The flow across a Prandtl-Meyer expansion wave is adiabatic

34058020796.

Question Number : 40 Question Id : 3405805200 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 : O

Correct Marks : 1 Wrong Marks : O

Using the Prandtl-Glauret rule, the compressible Cp disfribution based on the incompressible Cp,o distribution is given by

Options :

s: I—M2 34058020797. —cp,o

34058020798. ✔ $C_p = \frac{-p,o}{\sqrt{1-M_\infty^2}}$

$C_p = \frac{cp,o}{\sqrt{1+M_\infty^2}}$

34058020799. 8

cp,o

—

1+MZ

34058020800. 8

Question Number : 41 Question Id : 3405805201 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 : O

Correct Marks : 1 Wrong Marks : O

The critical Mach number for an ailfoil is the

Options :

Lowest Mach number at which bow shock appears in front of the airfoil

34058020801. ✖

Lowest Macll number at whicll drag stalts increasing significantly

34058020802. 8

Lowest Mach munber at which unsteady flow is obsewed over the ailfoil

34058020803.

Lowest Mach number at which sonic flow is achieved over the airfoil

34058020804.

Question Number : 42 Question Id : 3405805202 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 : O

Correct Marks : 1 Wrong Marks : O

For the flow through a convergent-divergent nozzle under pelfectly expanded

conditions

Options :

34058020805. ✔

34058020806. 8 Pressure increases monotonously from the chamber to the exit

Pressure increases from the chamber to the throat and then decreases from

34058020807.

throat to exit

Pressure decreases from the chamber to the throat and then increases from throat to exit

Pressure decreases monotonously from the chamber to the exit

34058020808. s:

Question Number : 43 Question Id : 3405805203 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 : O
Correct Marks : 1 Wrong Marks : O

The Newtonian theow for hypersonic flow predicts the Cp distribution as (0 is the angle between tangent to the surface and freestream)

Options :

Cp 2 sin2 9

34058020809.

Cp 2 cos2 9

34058020810.

34058020811.

$Cp — 2 \sin^3 9$

Cp 2 cos3 9

34058020812.

Question Number : 44 Question Id : 3405805204 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 : O
Correct Marks : 1 Wrong Marks : O

The propulsive emciency of a jet engine is defined as (V] is the jet velocity and VT is the freestream velocity)

Options :

✗ $\frac{V_\infty}{V_\infty+V_j}$

34058020813.

væ—vj

34058020814.

34058020815. 8

✓ $\frac{2V_\infty}{V_\infty+V_j}$

34058020816.

Question Number : 45 Question Id : 3405805205 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 : O

Correct Marks : 1 Wrong Marks : O

For reciprocating engines without superchargers

Options :

Shaft ✗ power increases with increase in altitude 34058020817.

✓ Shaft power decreases witli increase in altitude

34058020818.

Shaft power remams constant with altitude

34058020819.

Shaft power increases linearly up to cenain altitude and then remain

34058020820. constant with altitude

Question Number : 46 Question Id : 3405805206 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 : O
Correct Marks : 1 Wrong Marks : O

In a turbojet engine, which of the following statements is conect

Options :

34058020821. Thmst increases linearly with freestream velocity

Tlnust increases exponentially with freestream velocity

34058020822. 8

Tlnust decreases linearly with freestream velocity

34058020823.

Thmst remains almost constant with freestream velocity

34058020824.

Question Number : 47 Question Id : 3405805207 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 : O
Correct Marks : 1 Wrong Marks : O

In compalison to a turbojet engine which produces similar amount of thmst, the thiust specific fuel consumption of a turbofan engine is

Options :

Significantly higher than that of the turbojet engine

34058020825.

Equal to that of the turbojet engine

34058020826.

Significantly lower than that of the turbojet engine

34058020827.

34058020828. ✖ Marginally higher than that of the turbojet engine

Question Number : 48 Question Id : 3405805208 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 : O

Correct Marks : 1 Wrong Marks : O

WIIich of the following statements about turboprop engines is wrong

Options :

Turboprop engine is essentially a propeller driven by a gas-turbine engine

34058020829.

For most turboprops, about 5-10 % of the thmst is associated with the jet

34058020830. ✖ exhaust

34058020831. The free stream Mach number is resfficted to about 0.7

Turboprop is an ideal choice as engine for supersonic aircraft

34058020832.

Question Number : 49 Question Id : 3405805209 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 : O

Correct Marks : 1 Wrong Marks : O

Which of the following statements about use of afterbumers in turbojet/turbofan

engines is wrong

Options :

34058020833. Use of afterbumer results in reduced specific fuel consumption

Use of afterbumers results in enhanced levels of thrust

34058020834. ※

34058020835. s: Afterbumer is used only durmg shon bursts when higher tlnust is required

An afterbtmer is a duct downstream of the turbme into which extm fuel is

sprayed and bumed

34058020836. 8

Question Number : 50 Question Id : 3405805210 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 : O

Correct Marks : 1 Wrong Marks : O

Dilling the steady, level flight of an aircraft, which of the following relations is

con•ect

Options :

34058020837. 8 Thmst = Weight of the aircraft

34058020838. s: Lift = Drag

34058020839. 8 Thrust = Lift

34058020840. Lift = Weight of the aircraft

Question Number : 51 Question Id : 3405805211 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 : O

Correct Marks : 1 Wrong Marks : O

The velocity of an aircraft conesponding to minimum thmst required for steady,

level flight

34058020841. Increases with altitude

Options :

Decreases with altitude

34058020842. 8

Is independent of altitude

34058020843. ✘

Question Number : 52 Question Id : 3405805212 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 : O

34058020844. Remains constant up to about 11 km altitude

Correct Marks : 1 Wrong Marks : O

For an aircraft flying ill steady. level flight with Illaximum value of lift to drag ratio

Options :

34058020845. = Zero-lift drag Drag due to lift

Zero-lift drag = 3 X Drag due to lift

34058020846. ✘

Zero-lift drag = Drag due to lift 13

34058020847. 8

34058020848. Zero-lift drag = 2 X Drag due to lift

Question Number : 53 Question Id : 3405805213 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 : O

Correct Marks : 1 Wrong Marks : O

In steady. level flight. the maximum velocity of an aircraft is detenmed by the

Options :

34058020849. 8

High-speed intersection of the thmst required and thmst available curves

34058020850.

34058020851. 8 Low-speed intersection of tlle thmst required and thmst available curves

34058020852. 8 Average of the high-speed and low-speed intersections of the thrust required and thntst available ctuves

Minimum value of thmst required culve

Question Number : 54 Question Id : 3405805214 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 : O

Correct Marks : 1 Wrong Marks : O

W^{T}hich of the following is not an example of high-lift device

Options :

34058020853. s: Kluger flap

34058020854. 8 Fowler flap

Ventral strake

34058020855.

34058020856. 8 Leading-edge slat

Question Number : 55 Question Id : 3405805215 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 : O

Correct Marks : 1 Wrong Marks : O

During steady, unaccelerated climb of an aircraft, the rate of climb is given by

Options :

34058020857. 8 Weight/Excess power

Weight/Excess thmst

34058020858. 8

Excess power/Weight

34058020859.

34058020860. ✖ Excess thiust/Weight

Question Number : 56 Question Id : 3405805216 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 : O

Correct Marks : 1 Wrong Marks : O

For a jet-powered aircraft, the maximum rate of climb during steady, unaccelerated

flight is

Options :

34058020861. ✖ Independent of altitude

Dependent on thmst to weigllt ratio

34058020862.

34058020863. 8

Unaffected by wing loading

Independent of drag polar

34058020864.

Question Number : 57 Question Id : 3405805217 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 : O

Correct Marks : 1 Wrong Marks : O

Duling gliding of an unpowered aircraft, the equilibrium glide angle measured witli

respect to local horizontal is given by

Options :

$\tan 9 = -$

34058020865.

$\cos 9 = -$

34058020866.

$\tan 9 = \frac{D}{-}$

34058020867.

$\cos 9 = -$

34058020868.

Question Number : 58 Question Id : 3405805218 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 : O

Correct Marks : 1 Wrong Marks : O

Absolute ceiling of an aircraft is defined as the height at which

Options :

34058020869.

The maximum velocity is zero

34058020870.

The maximum rate of climb is zero

34058020871.

34058020872. s: The maximum rate of climb is 100 feet/minute The maximum tlnust is zero

Question Number : 59 Question Id : 3405805219 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 : O
Correct Marks : 1 Wrong Marks : O

The range of a jet-propelled aircraft is directly proportional to

Options :

34058020873. 8 Thrust specific fuel consumption

34058020874. CD

34058020875.

34058020876.

Question Number : 60 Question Id : 3405805220 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 : O
Correct Marks : 1 Wrong Marks : O

Endurance of an aircraft is defined as the

Options :

Amount of time the aircraft can stay in air on one load of fuel 34058020877.

Maximum distance that the aircraft can cover on one load of fuel 34058020878.

34058020879. 8 Maximum distance that the aircraft can cover while gliding

Amount of time the aircraft can stay in air while gliding 34058020880.

Question Number : 61 Question Id : 3405805221 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 : O
Correct Marks : 1 Wrong Marks : O

For a steady level tillil of an aircraft, the tum radius (R) is related to the free.stream velocity (Vm) and load factor (n) as

Options :

$$R = \frac{V_\infty^2}{g\sqrt{n^2+1}}$$

34058020881. 8

34058020882. ✔ $R = \frac{V_\infty^2}{g\sqrt{n^2-1}}$

34058020883. ✘ $R = \frac{V'}{\sqrt{n^2-1}}$

34058020884. ✘ $R = \frac{gV_\infty^2}{\sqrt{n^2-1}}$

Question Number : 62 Question Id : 3405805222 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 : O

Correct Marks : 1 Wrong Marks : O

The maximum tum rate for steady level tum does not depend on

Options :

34058020885. s: Thrust to weight ratio

34058020886. ✘ Wing loading

Drag polar

34058020887. ✘

34058020888. Excess power

Question Number : 63 Question Id : 3405805223 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 : O

Correct Marks : 1 Wrong Marks : O

On the V-N diagram for an airplane, the comer velocity does not corespond to

Options :

34058020889. 8 CL and n are simultaneously at their maximum value

CD is having its minimum value

34058020890.

Smallest possible instantaneous tum radius

34058020891. 8

Largest possible instantaneous tum rate 34058020892. ✖

Question Number : 64 Question Id : 3405805224 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 : O

Correct Marks : 1 Wrong Marks : O

The ground-roll distance required for take-off of a jet aircraft

Options :

34058020893. 8 Decreases with wing loading

Increases with tlnust to weight ratio

34058020894. ✖

Decreases with altitude

34058020895. 8

Decreases with (CL)max

34058020896.

Question Number : 65 Question Id : 3405805225 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 : O

Correct Marks : 1 Wrong Marks : O

Which ofthe following is not an advantage of a pusher configuration for the engine

Options :

34058020897. ✖ Less disturbed flow field over wing and fuselage

34058020898. ✖ Engine noise in the cabin is reduced

34058020899.CG is shifted reanvard and hence affecting longitudinal stability

Pilot's field of view is better

34058020900.

Question Number : 66 Question Id : 3405805226 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 : O

Correct Marks : 1 Wrong Marks : O

Kepler's first law states that

Options :

Planets follow circular orbits around the Sun

34058020901. 8

Planets follow elliptical orbits around the Sun

34058020902.

Planets follow parabolic orbits around the Sun

34058020903.

Planets follow hyperbolic orbits around the Sun

34058020904.

Question Number : 67 Question Id : 3405805227 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 : O
Correct Marks : 1 Wrong Marks : O

Low Earth Orbits are not used by

Options :

34058020905. Remote sensing satellites

Intemational Space Station

34058020906.

34058020907. Hubble Space Telescope

GPS satellites

34058020908.

Question Number : 68 Question Id : 3405805228 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 : O
Correct Marks : 1 Wrong Marks : O

WIIich of the following is not an advantage of Low Ealtll Orbits

Options :

Less energy is required to place a satellite in LEO compared to Medium

34058020909. Lower communication delay

34058020910.

34058020911.

Able to observe Earth more clearly because of proximity

Atmospheric drag

Ealth Orbit or Geosynchronous orbit

34058020912.

Question Number : 69 Question Id : 3405805229 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 : O

Correct Marks : 1 Wrong Marks : O

Wiic11 ofthe following is not a cliaractelistic of a satellite in Geostationmy orbit

Options :

34058020913. s: The satellite remains above the same point on the Ealth's equator

The orbit of the satellite is circular around ealth

34058020914.

The distance of the satellite from the Ealth's surface is 6378 Ian

34058020915.

The satellite has the same angular velocity as that of Earth

34058020916. s:

Question Number : 70 Question Id : 3405805230 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 : O

Correct Marks : 1 Wrong Marks : O

The maximum latitude visible from a satellite m geostationaw orbit at a distance of

42164 km from the Eafill's cellter is (Givell that the radius ofEa1th is 6378 km)

Options :

34058020917. $\sin^{-1}\left(\frac{6378}{42164}\right)$

34058020918. ✔ $\cos^{-1}\left(\frac{6378}{42164}\right)$

34058020919. 8 $\frac{6378}{42164}\tan^{-1}$

34058020920. 8 $\frac{42164}{6378}\tan$

Question Number : 71 Question Id : 3405805231 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 : O
Correct Marks : 1 Wrong Marks : O

For a satellite in an elliptical orbit

Options :

34058020921. 8

The time period is inversely proportional to the semi major axis

34058020922. 8

The square of the time peliod is directly proportional to the cube of the semi major axis

34058020923.

The time period is directly proportional to the semi major axis

The cube of flie time period is directly propofiional to the square of the semi major axis

34058020924. 8

Question Number : 72 Question Id : 3405805232 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 : O

Correct Marks : 1 Wrong Marks : O

The escape velocity from a planet of mass M and radius R is

Options :

34058020925.

$\frac{2GM}{}$

GM

34058020926. 8

GM

34058020927.

GM

34058020928.

Question Number : 73 Question Id : 3405805233 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 : O

Correct Marks : 1 Wrong Marks : O

Consider the restricted three body problem where m_1, m_2 and m_3 are the masses with m_1, $m_2 >> m_3$. In a noninertial, co-moving coordinate system with the origin at the center of mass of ml and and x-axis oriented towards the third mass (1113) will have at the Lagrange pomts

Options :

Zero velocity and non-zero acceleration

34058020929.

34058020930. Zero velocity and zero acceleration

Non-zero velocity and non-zero acceleration

34058020931.

s: Non-zero velocity and zero acceleration

34058020932.

Question Number : 74 Question Id : 3405805234 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 : O

Correct Marks : 1 Wrong Marks : O

The number of Lagrange points for the Ealth-Moon system is

Options :

34058020933. One

34058020934. Three

34058020935. Five

34058020936. Seven

Question Number : 75 Question Id : 3405805235 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 : O
Correct Marks : 1 Wrong Marks : O

Wiich of the following is not true about Hohmann transfer

Options :

It involves transfer between two coplanar circular orbits sharing the same

34058020937. focus

34058020938. It involves two impulse manoeuvres

34058020939. 8 The trajectory is an elliptical orbit tangent to both circles

34058020940. It involves continuous operation of onboard rockets

Question Number : 76 Question Id : 3405805236 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 : O
Correct Marks : 1 Wrong Marks : O

Launching a satellite due east from the equator has the benefit of

Options :

34058020941. Taking advantage of the Ealtll's rotational velocity

Reduced gravitational pull of the Earth

34058020942. s:

Atmospheric wind conditions being favorable

34058020943. 8

Gravitational pull from the Moon

34058020944.

Question Number : 77 Question Id : 3405805237 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 : O

Correct Marks : 1 Wrong Marks : O

The charactenstic velocity of a rocket propulsion system is defined as (PI is the

chamber pressure, At is the throat area and Th is the propellant mass flow rate)

Options :

PI

Atm

34058020945. 34058020946.

$\frac{p_1 A_t}{\dot{m}}$

34058020947.

At

34058020948.

Question Number : 78 Question Id : 3405805238 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 : O

Correct Marks : 1 Wrong Marks : O

Propellant mass fraction for a rocket refers to the ratio of

Options :

Oxidizer mass to fuel mass

34058020949. s:

Propellant mass to initial mass of the rocket

34058020950.

Fuel mass to oxidizer mass

34058020951.

Fuel mass to mass of rocket structure

34058020952.

Question Number : 79 Question Id : 3405805239 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 : O

Correct Marks : 1 Wrong Marks : O

For a given chamber pressure to ambient pressure, the optimum thntst coefficient of

a rocket nozzle is achieved when

Options :

Exit pressure = 2 X ambient pressure

34058020953.

Exit pressure = 3 X ambient pressure

34058020954.

Exit pressure = ambient pressure

34058020955.

34058020956. ✖ Exit pressure = ambient pressure / 2

Question Number : 80 Question Id : 3405805240 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 : O

Correct Marks : 1 Wrong Marks : O

Wiicll ofthe following statements about cliaracteristic velocity of a rocket propulsion system is umong

Options :

34058020957. ✘ It is a function of propellant charactelistics

It is dependent on combustion chamber design

34058020958. 8

34058020959. 8

It is used as a figure of merit in compaling propellant combinations

It can be used for seeing tlle altitude valiation for a given nozzle configuration

34058020960.

Question Number : 81 Question Id : 3405805241 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 : O

Correct Marks : 1 Wrong Marks : O

Which of the following characteristics about a convergent-divergent rocket nozzle operating at under-expanded condition is wrong

Options :

34058020961. s: The exit pressure is greater than the etemal pressure

Exit area is too small for optimum expansion

34058020962. ✘

Expansion waves are seen outside the nozzle

34058020963.

34058020964. Nonnal shocks are present inside the nozzle

Question Number : 82 Question Id : 3405805242 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 : O

Correct Marks : 1 Wrong Marks : O

For a rocket operating in yavity-free & drag-free environment, the velocity

Increment (u) is related to effective exhaust velocity (c), initial mass (1110) and final

mass (m) as

Options :

u = c In

34058020965.

34058020966. 8

$$u = c \left(\frac{m_0}{\text{mf}} \right.$$

u c In

34058020967.

$$u = c \left(\frac{m_f}{m_0} \right)$$

34058020968.

Question Number : 83 Question Id : 3405805243 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 : O

Correct Marks : 1 Wrong Marks : O

IMIich of the following is not significant cause for pelturbations for satellite

trajectory in low altitude orbits

Options :

Earth's oblateness 34058020969.

Aerodynamics drag

34058020970. 8

Solar radiation

34058020971.

Ealth 's rotation 34058020972.

Question Number : 84 Question Id : 3405805244 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 : O

Correct Marks : 1 Wrong Marks : O

Which of the following is not an advantage associated with multi-staging in rockets

Options :

34058020973. s:

Can provide higher velocities

Can cany higher payload

34058020974. ✖

Improved overall perfonnance

34058020975.

Extra weight associated with stage-separation mechanism

34058020976.

Question Number : 85 Question Id : 3405805245 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 : O

Correct Marks : 1 Wrong Marks : O

For stable combustion of solid propellants. the billiling rate exponent (n) should be

Options :

34058020977.

34058020978. n = 1

34058020979. ✔ $0 < n < 1$

$8\ 11 > 1$

34058020980.

Question Number : 86 Question Id : 3405805246 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 : O

Correct Marks : 1 Wrong Marks : O

Star grain configuration of solid rocket propellant results in

Options :

Neutral buming

34058020981.

Progressive buming

34058020982. 8

Regl'essive bummg

34058020983. 8

Progressive-regressive buming

34058020984.

Question Number : 87 Question Id : 3405805247 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 : O

Correct Marks : 1 Wrong Marks : O

A common binder used in composite solid propellants is

Options :

34058020985. ✗ Nitroglycerine

34058020986. Nitrocellulose

34058020987. Hydroxyl terminated polybutadiene

34058020988. 8 Ammonium perchlorate

Question Number : 88 Question Id : 3405805248 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 : O

Correct Marks : 1 Wrong Marks : O

WIlich of the following is not an advantage of liquid rocket engine relative to solid rocket motor

Options :

34058020989. s: Higher specific impulse

34058020990. ✓ Simple design

34058020991. ✗ Can be randomly stopped and restarted

34058020992. 8 Can be tested at full thlust on ground

Question Number : 89 Question Id : 3405805249 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 : O

Correct Marks : 1 Wrong Marks : O

Arcjet electrothermal thnusters using Hydrogen give specific impulse around

Options :

34058020993. 1 to 10 seconds

34058020994. 500 to 1000 seconds

34058020995. 100 to 200 seconds

34058020996. 400 to 500 seconds

Question Number : 90 Question Id : 3405805250 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 : O

Correct Marks : 1 Wrong Marks : O

For the two dimellsional state of stress at a point represented by the Mohr's circle,

whicll ofthe following statement is false

Options :

34058020997. s: The center of the circle lies on the G axis

34058020998. The radius of the circle is equal to the maximum value of plincipal stress

34058020999. 8 The radius of the circle is equal to the maximum value of shear stress

The radius of the circle is equal to half the difference between the

34058021000. s: maximum and minimum principal stresses

Question Number : 91 Question Id : 3405805251 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 : O

Correct Marks : 1 Wrong Marks : O

The modulus of ligidity (G) is related to the Young's modulus (E) and Poisson's

mtio (v) as

Options :

34058021 001. $2(1+v)$

34058021002. ✖ $G = \frac{E}{2}$

34058021003. $G = \frac{E}{(1+\nu)}$

34058021004. ✖ $G = \frac{E}{2(1-\nu)}$

Question Number : 92 Question Id : 3405805252 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 : O

Correct Marks : 1 Wrong Marks : O

The vefiical deflection produced by a tip load (P) on a cantilever of length (L) and

bending ligidity (El) is

Options :

34058021 005. 3E1

PL3

34058021006. S: 2E1

P L2

34058021007. 3E1

34058021008. 2E1

Question Number : 93 Question Id : 3405805253 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 : O

Correct Marks : 1 Wrong Marks : O

The maximum deflection for a square plate (a x a) and thickness (t), simply supported on all four edges and subjected to uniform load of intensity (q) with

Young's Modulus (E) and Poisson's ratio = 0.3, is propofiional to

Options :

$\frac{4}{}$

Et3 34058021 009.

$\frac{4}{}$

Et4 34058021010.

34058021011. ' a? qt4

34058021012. 8 Ea4

Question Number : 94 Question Id : 3405805254 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 : O

Correct Marks : 1 Wrong Marks : O

The buckling load associated with a beam of length (L) and bending ligidity

(ET) and simply suppolted on both edges is

Options :

$\frac{7t2EI}{}$

34058021 013.

$\frac{PEI}{}$

34058021014. ※

$\frac{Tt2E1}{}$

34058021015. 8

34058021016. s:

Question Number : 95 Question Id : 3405805255 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 : O

Correct Marks : 1 Wrong Marks : O

The buckling load of a clamped-clamped beam is_____that of a simply-suppolted beam of same length and bending ligidity

Options :

Equal to

34058021017.

Twice

34058021018.

Four times

34058021 019.

Half

34058021020. 8

Question Number : 96 Question Id : 3405805256 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 : O

Correct Marks : 1 Wrong Marks : O

The 2024 alloy of aluminum contains

Options :

34058021021. 8 Copper. zinc and titanium

34058021 022.

Copper, maglesium and manganese

Copper and iron

34058021023.

34058021024. ✖ Iron and suphur

Question Number : 97 Question Id : 3405805257 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 : O
Correct Marks : 1 Wrong Marks : O

Whichofthe following is not a conect reason for using titanium for load beamg

stmctural components m aircmft

Options :

High specific strength and stimess

34058021025. 8

Considerable strength at temperatures 400^0C -500^0C

34058021026.

Good resistance to corrosion

34058021027. 8

Lower density compared to aluminum

34058021 028.

Question Number : 98 Question Id : 3405805258 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 : O
Correct Marks : 1 Wrong Marks : O

WIIic11 of the following is a disadvantage associated with CFRP In comparison to

Aluminum alloys

Options :

34058021029. 8 Higher Young's modulus

Higher tensile strength

34058021030. 8

Blittle

34058021 031. in nature

Lower density

34058021032.

Question Number : 99 Question Id : 3405805259 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 : O

Correct Marks : 1 Wrong Marks : O

Wiicll of the following is not a ftnction of ribs in the aircraft wing süucture

Options :

34058021 033.

Maintain shape of cross section of wings

34058021034.

Providing end restraint to stiffeners and enhance buckling load

34058021035.

34058021036. 8 Act of formers of the aerofoil shape of wing

Provide bending stifffess to the wing

Question Number : 100 Question Id : 3405805260 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 : O
Correct Marks : 1 Wrong Marks : O
Which of the following statement is false about the nature of loading on the wing

Options :

34058021037. ✘ On the ground, the upper surface of wing experiences tensile forces and the lower surface expeliences compressive forces

34058021038. 8 In flight, tlle upper surface ofwmg experiences conipressive forces and the lower surface expeliences tensile forces

34058021 039. Wings do not experience bending loads

34058021040. s: Wings with engines mounted on them can expefience torsional loads

Question Number : 101 Question Id : 3405805261 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 : O
Correct Marks : 1 Wrong Marks : O
Which ofthe following statement about "safe life" and "fail-safe" approaches to design of aircraft süuctural components is wrong

Options :

34058021041. 8 In the safe life approach, the stmcture is designed to have a minimum life during wllich no catastrophic damage will occur

The fail-safe approach considers that the failure of a member in a redundant stmcture does not lead to collapse of complete stmcture

34058021042. 8

Clitical load bealing components need not have a safe life

34058021 043.

More economical to design palt of snucture using fail-safe approacll

34058021044.

Question Number : 102 Question Id : 3405805262 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 : O

Correct Marks : 1 Wrong Marks : O

For a beam in bending, which of the following statement about neutral axis is wrong

Options :

It is assumed that plane sections pelpendicular to the axis remain plane

34058021045. 8 after bending

The shear stress on the neutral axis is zero

34058021 046.

The nonnal stress on the neutral axis is zero

34058021047. 8

The neutral axis passes through the centroid of the cross sectional area

34058021048.

Question Number : 103 Question Id : 3405805263 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 : O

Correct Marks : 1 Wrong Marks : O

The fundamental natural frequency of a simply suppofied beam of length

(L). density (p), area of cross section (A) and bending stiffress (El)

Options :

π EI

2L2 PA

34058021 049.

$$\frac{\pi}{2L^2}\sqrt{\frac{\rho A}{EI}}$$

34058021050. 8

π EI

2L PA

34058021051. 8

πPA

2LEI

34058021052. 8

Question Number : 104 Question Id : 3405805264 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 : O

Correct Marks : 1 Wrong Marks : O

The function of the spoilers is not to

Options :

Reduce the lift

34058021053.

Increase the drag

34058021054. 8

Reduce the thmst

34058021 055.

Reduce the airspeed

34058021056.

Question Number : 105 Question Id : 3405805265 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 : O
Correct Marks : 1 Wrong Marks : O

WIIen the left nidder pedal is pushed fonvard

Options :

34058021 057. Aircraft nose yaws towards left

Aircraft pitches up

34058021058. ✗

Aircraft pitches down

34058021059. ✗

s: Aircraft rolls starboard wing down

34058021060.

Question Number : 106 Question Id : 3405805266 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 : O
Correct Marks : 1 Wrong Marks : O

Temperature inversion refers to

Options :

34058021061. ✗ Change of sign of temperature when expressed in degree Celsius

✗ Change of sign of temperature when expressed in degree Fahrenheit
34058021062.

Change of sign of the lapse rate relative to its usual sign at any layer in the

34058021 063. ✓ aünosphere
34058021064. ✗ Temperature at any altitude reducing below the surface temperature

Question Number : 107 Question Id : 3405805267 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 : O
Correct Marks : 1 Wrong Marks : O

Doldnms are

Options :

34058021 065.Calm winds prevailing near the Equator

Winds from high-pressure sub-tropical belt to Equator

34058021066.

34058021067. s: Southwesterly winds in the northem hemisphere

Cold winds blowing in the Arctic region

34058021068.

Question Number : 108 Question Id : 3405805268 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 : O
Correct Marks : 1 Wrong Marks : O

For incompressible flows, the equivalent air speed (Vus) is related to tille air speed

(V) and density ratio (c=

PSea level Options :

34058021069. EAS = σ

34058021 070. e EAS $-$

EAS = V/σ34058021071.

34058021072. 8 EAS $= V/\sqrt{\sigma}$

Question Number : 109 Question Id : 3405805269 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 : O

Correct Marks : 1 Wrong Marks : O

Beaufort scale is use to

Options :

Measure pressure

34058021073. 8

Measure density

34058021074.

Classify humidity

34058021075. ✖

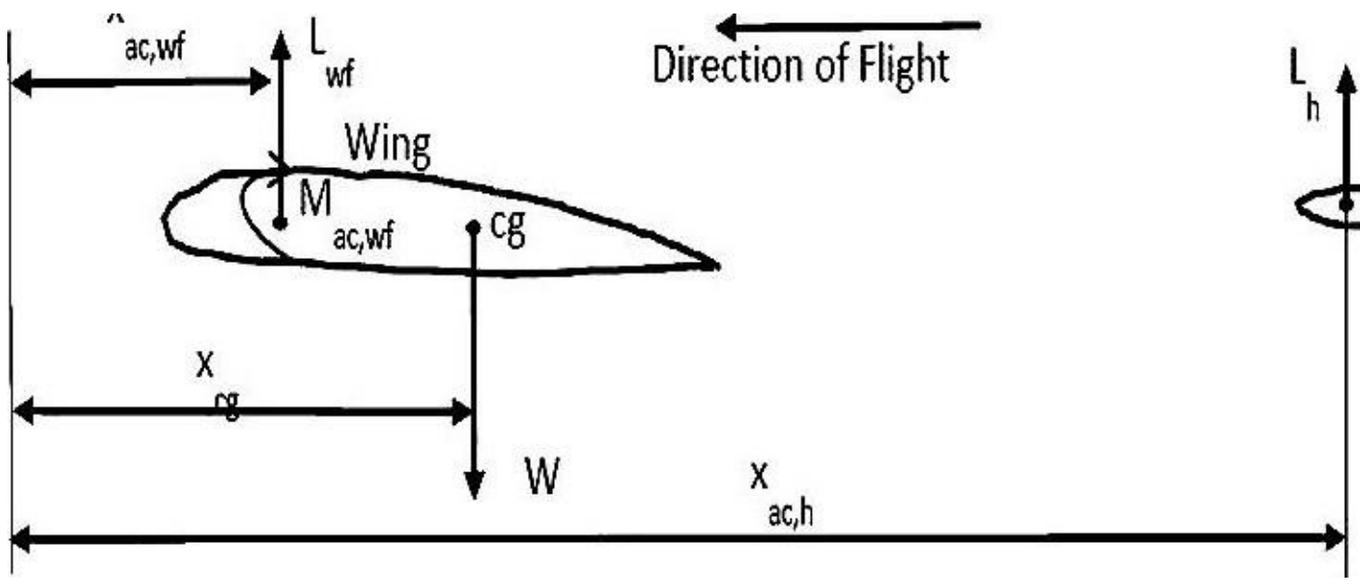
34058021 076. 1 ass ify wind speeds

Question Number : 110 Question Id : 3405805270 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 : O

Correct Marks : 1 Wrong Marks : O

. The wing-tail arrangement of a conventional anplane can be represented as below.

For moment equilibrium, the following condition must hold x



Options :

34058021077. Mac w + w(xcg - Xac,wf) = 0

34058021078. Mac$_{wf}$ + Lwf(xcg xac,wf) — Lh (xac,h - xcg) ___ 0

34058021079. M + w(xcg xac,wf) — Lh (xac,h xcg) ___ 0

34058021080. ac,wf

34058021081. 8 Macwf + Lwf(xcg ac,wf) _w (xac,h - X) = 0

Question Number : 111 Question Id : 3405805271 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 : O

Correct Marks : 1 Wrong Marks : O

Ifxcg < xac,wfand 0 for a conventional aircraft configuration, then to satisfy the

moment equilibrium (Lh is the lift produced by the Imzontal tail)

Options :

Lh=o

34058021082M h

34058021083. Lh>0

34058021084. 8 Lvf=o

Question Number : 112 Question Id : 3405805272 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 : O

Correct Marks : 1 Wrong Marks : O

For an aircraft having a conventional configuration, the elevator hinge moment does not depend on

Options :

34058021085. 8 Angle of attack

Elevator angle

34058021086. 8

34058021 087.

Rudder angle

Elevator tab angle 34058021088.

Question Number : 113 Question Id : 3405805273 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 : O

Correct Marks : 1 Wrong Marks : O

The function of the elevator tiim tab is to

Options :

Enhance lift

34058021089.

Reduce drag

34058021090.

34058021091. Throttle the engine

Maintain steady flight with zero stick force

34058021 092.

Question Number : 114 Question Id : 3405805274 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 : O
Correct Marks : 1 Wrong Marks : O

Wiich of the following statement about the neutral point of an aircraft in a conventional configuration is tille

Options :

34058021 093. The stick-free neutral point is forward of the stick-fixed neutral point

The stick-free neutral point is aft of the stick-fixed neutral point 34058021094. 8

The stick-free neutral point is always at the cg of the aircraft 34058021095. 8

The stick- free neutral point is always at the midpoint of the wing 34058021096.

Question Number : 115 Question Id : 3405805275 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 : O
Correct Marks : 1 Wrong Marks : O

The shon period undamped natural frequency associated with the longitudinal motion of a conventional aircraft configuration does not depend on tlle

Options :

Location of CG relative to the aerodynamic center of the an•craft 34058021097.

Dynamic pressure

34058021098.

Pitching moment of ineffia

34058021099. 8

Rolling moment of ineffia 34058021 100.

Question Number : 116 Question Id : 3405805276 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 : O
Correct Marks : 1 Wrong Marks : O

WIIich of the following statements about the phugoid motion in longitudinal mode is wrong

Options :

During the motion, angle of attack remains constant 34058021 101.

34058021 102. The undamped natural frequency is dependent on the velocity

34058021 103. 8 The damping ratio depends on the aerodynamic coefficients

The dalnping ratio is independent of the aspect ratio of the wings 34058021 104.

Question Number : 117 Question Id : 3405805277 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 : O
Correct Marks : 1 Wrong Marks : O

The undamped Dutch roll natural frequency does not depend on

Options :

34058021 105. 8 Static directional stability

Dynamic pressure

34058021 106.

Pitching moment of inertia

34058021 107.

34058021 108. s: Yawing moment of inertia

Question Number : 118 Question Id : 3405805278 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 : O
Correct Marks : 1 Wrong Marks : O

The Cooper-Hmper pilot rating scale is used to

Options :

34058021 109.Rate the flying qualities of a given aircraft

Rate the speed of the aircraft

34058021 1 10. 8

Rate the appearance of the aircraft

34058021111. ※

Rate the endurance of the aircraft

34058021 1 12. 8

Question Number : 119 Question Id : 3405805279 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 : O
Correct Marks : 1 Wrong Marks : O

Degree of reaction in a turbomachine rotor is defined as the

Options :

Ratio of change in stagnation enthalpy across stage to the change in

34058021 1 13. 8 enthalpy across rotor

Ratio of change in enthalpy across rotor to the change in stagnation enthalpy across stage

34058021 1 14.

Ratio of change in enthalpy across stator to the change in stagnation enthalpy across stage

34058021 1 15. 8

Ratio of change in enthalpy across rotor to the change in enthalpy across stator

34058021 1 16.

Question Number : 120 Question Id : 3405805280 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 : O
Correct Marks : 1 Wrong Marks : O

Midspan shrouds are provided in turbomachine1Y blades to

Options :

Induce separation of flow

34058021 1 17.

Enhance the ineffia of the blade 34058021118.

34058021119. Improved heat tmnsfer

34058021120. Reduce blade vibration

Indiaz