



# 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.

<b>Question Paper Name :</b>	Aerospace Engineering 10th June 2024 Shift 2
<b>Subject Name :</b>	Aerospace Engineering
<b>Creation Date :</b>	2024-06-11 14:25:23
<b>Duration :</b>	120
<b>Total Marks :</b>	120
<b>Display Marks:</b>	Yes
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Actual Answer Key :</b>	Yes
<b>Change Font Color :</b>	No
<b>Change Background Color :</b>	No
<b>Change Theme :</b>	No
<b>Help Button :</b>	No
<b>Show Reports :</b>	No
<b>Show Progress Bar :</b>	No

## Aerospace Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	38382334
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	120

## Mathematics

<b>Section Id :</b>	38382399
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory

Number of Questions :	10
Number of Questions to be attempted :	10
Section Marks :	10
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	38382399
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 3838234921 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

A is a  $m \times n$  matrix where  $m > 7$  and  $n > 8$ . If all the minors of the 7th order of A vanish and there is a 6th order non zero minor exist for A, then rank of A is

Options :

1. ✘  $\leq 5$
2. ✘ 5
3. ✔ 6
4. ✘  $\leq 6$

Question Number : 2 Question Id : 3838234922 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Which of the following can't be an eigenvalue of any Unitary matrix?

Options :

1. ✔  $\frac{3}{2} + \frac{1}{2}i$
2. ✘  $\frac{1}{2} + \frac{\sqrt{3}}{2}i$
3. ✘  $\frac{\sqrt{7}}{3} + \frac{\sqrt{2}}{3}i$
4. ✘  $i$

Question Number : 3 Question Id : 3838234923 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  is defined by  $f(x) = -\frac{|x|^3 + |x|}{1+x^2}$ , then the set of points where  $f(x)$  is not differentiable is

Options :

1. ✘  $\{0, 1, -1\}$

2. ✘  $\{1, -1\}$

3. ✔  $\{0\}$

4. ✘  $\{1\}$

Question Number : 4 Question Id : 3838234924 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

If  $u = f(r)$ ,  $r^2 = x^2 + y^2 + z^2$ , then  $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} =$

Options :

1. ✘  $f''(r) \cdot \frac{3}{r}$

2. ✔  $f''(r) + \frac{2}{r} f'(r)$

3. ✘  $f''(r)$

4. ✘  $f''(r) + \frac{3}{r} f'(r)$

Question Number : 5 Question Id : 3838234925 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Let  $\vec{F}, \vec{G}$  be two vector point functions such that  $\vec{F} = \nabla \times \vec{G}$ . Let S be a closed surface, enclosing the region E.  $\int_S \vec{F} \cdot \vec{N} \, ds =$

Options :

1. ✘  $\int_S \nabla \times \vec{F} \cdot \vec{N} \, ds$

2. ✘  $\iiint_E \vec{F} \cdot \vec{G} \, dx dy dz$

3. ✔ 0

4. ✘  $\int_V \vec{G} \, dv$

Question Number : 6 Question Id : 3838234926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

If inverse Laplace transform of  $e^{-\pi s} \cot^{-1} s$  is  $f(t)$ , then  $f\left(\frac{3\pi}{2}\right) =$

Options :

1. ✘  $-\frac{2}{\pi}$

2. ✔  $\frac{2}{\pi}$

3. ✘  $\frac{\pi}{2}$

4. ✘  $-\frac{\pi}{2}$

Question Number : 7 Question Id : 3838234927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

If the particular integral of  $(D^2 + D + 1)y = x^3 + \sin 2x$  is

$Ax^3 + Bx^2 + Cx + D + P \sin 2x + Q \cos 2x$ , then  $3(A + B + C) + D - 13(P + Q) =$

**Options :**

1. ✓ 5

2. ✗ -5

3. ✗ 6

4. ✗ -6

**Question Number : 8 Question Id : 3838234928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The general solution of  $\frac{dy}{dx} = \frac{1}{3x+5y}$  is

**Options :**

1. ✗  $y = Ce^{3x} + \frac{5}{3}x + \frac{1}{3}$

2. ✗  $(9x + 15y + 5) = Ke^{3x}$

3. ✓  $y = \frac{1}{3} \log(9x + 15y + 5) + C$

4. ✗  $x = \frac{5}{3}y + \frac{1}{9} + Ce^{3y}$

**Question Number : 9 Question Id : 3838234929 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Consider the statements

S1: If  $f(a).f(b) < 0$  then there exist a root for  $f(x) = 0$  in between  $a$  and  $b$

S2: The Simpson's  $\frac{1}{3}$  rule approximates the definite integral  $\int_a^b f(x)dx$  as sum of the

areas under the parabolas

Which of the following is correct?

**Options :**

1. ✓ S1 is false, S2 is true

2. ✖ S1 is true, S2 is false
3. ✖ S1 and S2 both are true
4. ✖ Neither S1 nor S2 is true

**Question Number : 10 Question Id : 3838234930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The iterative formula to find the root of  $\sqrt[5]{x^3} = 2$  using Newton's-Raphson method is  $x_{n+1} =$

**Options :**

1. ✖  $\frac{3x_n - 2x_n^2}{3}$
2. ✔  $\frac{1}{3} \left[ 2x_n + \frac{32}{x_n^2} \right]$
3. ✖  $\frac{1}{3} \left[ 3x_n + \frac{32}{x_n^2} \right]$
4. ✖  $\frac{1}{3} \left[ 2x_n + \frac{3}{x_n^2} \right]$

## Aerospace Engineering

<b>Section Id :</b>	383823100
<b>Section Number :</b>	2
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	110
<b>Number of Questions to be attempted :</b>	110
<b>Section Marks :</b>	110
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	383823100

Question Shuffling Allowed :

Yes

Question Number : 11 Question Id : 3838234931 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

For the neutrally stable state of the atmosphere, the adiabatic lapse rate is

Options :

1. ✘ 0.75 °C per kilometer
2. ✘ 3.75 °C per kilometer
3. ✘ 6.75 °C per kilometer
4. ✔ 9.75 °C per kilometer

Question Number : 12 Question Id : 3838234932 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

For the airfoil, the angle between the relative velocity vector and the chord line is

Options :

1. ✘ pitch angle
2. ✔ angle of attack
3. ✘ angle of incidence
4. ✘ angle of inclination

Question Number : 13 Question Id : 3838234933 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Winds in which the Coriolis force is equal and opposite to the pressure-gradient force are called

Options :

1. ✔ geostrophic wind
2. ✘ hurricane

3. ✘ tornado

4. ✘ thunderstorm

**Question Number : 14 Question Id : 3838234934 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

What is the percentage of increment in lift produced by two main wings when compared to monoplane of similar aircraft?

**Options :**

1. ✘ 10 %

2. ✔ 20 %

3. ✘ 30 %

4. ✘ 50 %

**Question Number : 15 Question Id : 3838234935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

True airspeed (TAS) is

( $\rho_0$  - Air density at sea level,  $\rho$  - Air density through which aircraft flying)

**Options :**

1. ✔  $EAS \sqrt{\frac{\rho_0}{\rho}}$

2. ✘  $IAS \sqrt{\frac{\rho_0}{\rho}}$

3. ✘  $CAS \sqrt{\frac{\rho_0}{\rho}}$

4. ✘  $EAS \sqrt{\frac{\rho}{\rho_0}}$



**Question Number : 16 Question Id : 3838234936 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

Which of the following instrument is used to indicate air speed corrected for compressibility effect?

**Options :**

1. ✘ Altimeter
2. ✘ Gyroscope
3. ✔ Mach meter
4. ✘ Pitot probe

**Question Number : 17 Question Id : 3838234937 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The minimum glide angle of the unpowered flight depends on

**Options :**

1. ✔ lift to drag ratio is maximum
2. ✘ rate of descent is minimum
3. ✘ lift force
4. ✘ lift to weight ratio is maximum

**Question Number : 18 Question Id : 3838234938 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The service ceiling of transport aircraft is the altitude

**Options :**

1. ✘ that is half way between sea-level and absolute ceiling
2. ✘ at which it can cruise with one engine operational
3. ✘ at which its rate of climb is zero

4. ✓ at which its rate of climb is 0.508 m/s

**Question Number : 19 Question Id : 3838234939 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The drag of an aircraft in steady climbing flight at a given forward speed is

**Options :**

1. ✗ inversely proportional to climb angle
2. ✓ higher than drag at steady level flight at the same forward speed
3. ✗ lower than drag at steady level flight at the same forward speed
4. ✗ Independent of climb angle

**Question Number : 20 Question Id : 3838234940 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A conventional Altimeter is

**Options :**

1. ✓ pressure transducer
2. ✗ velocity transducer
3. ✗ temperature transducer
4. ✗ density transducer

**Question Number : 21 Question Id : 3838234941 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If an aircraft is climbing at a constant speed in a straight line at a steep angle of climb, then the load factor it sustains during the climb is

**Options :**

1. ✗ equal to one

2. ✘ greater than one
3. ✔ positive but less than one
4. ✘ dependent on the weight of the aircraft

**Question Number : 22 Question Id : 3838234942 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The lift acting on an aircraft climbing vertically up is

**Options :**

1. ✘ equal to its weight
2. ✔ zero
3. ✘ equal to the drag
4. ✘ equal to the thrust

**Question Number : 23 Question Id : 3838234943 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For an airplane to be statically stable, its centre of gravity must always be

**Options :**

1. ✘ ahead of wing aerodynamic centre
2. ✘ aft of the wing aerodynamic centre
3. ✔ ahead of neutral point
4. ✘ aft of neutral point

**Question Number : 24 Question Id : 3838234944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The control surface associated with engine inoperative condition is

**Options :**

1. ✓ rudder
2. ✗ elevator
3. ✗ fuselage
4. ✗ aileron

**Question Number : 25 Question Id : 3838234945 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The rolling moment due to side slip is called

**Options :**

1. ✓ dihedral effect
2. ✗ anhedral effect
3. ✗ adverse yaw
4. ✗ dutch roll

**Question Number : 26 Question Id : 3838234946 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Aileron reversal speed can be increased by

**Options :**

1. ✗ increasing the offset distance between the aerodynamic center and center of twist
2. ✗ increasing the offset distance between the C.G of the airplane and center of twist
3. ✓ increasing the stiffness of the wing
4. ✗ increasing the offset distance between the aerodynamic center and C.G of the airplane

Question Number : 27 Question Id : 3838234947 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Control of hinge moment parameters is called

Options :

1. ✘ aerodynamic efficiency
2. ✘ directional stability
3. ✘ lateral stability
4. ✔ aerodynamic balancing

Question Number : 28 Question Id : 3838234948 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The dutch roll mode of the aircraft can be excited by applying

Options :

1. ✘ a step input to the elevators
2. ✔ a step input to the rudder
3. ✘ sinusoidal input to the aileron
4. ✘ an impulse input to the elevators

Question Number : 29 Question Id : 3838234949 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Which one of the following is true with respect to porpoise mode of an aircraft?

Options :

1. ✘ long period and weak damping
2. ✘ long period and strong damping
3. ✔ short period and weak damping

4. ✘ short period and strong damping

**Question Number : 30 Question Id : 3838234950 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

When the fuselage reference line coincides with the relative wind direction, then the axes system refers to

**Options :**

1. ✘ Stability Axes
2. ✔ Wind Axes
3. ✘ Yaw Axes
4. ✘ Navigational Axes

**Question Number : 31 Question Id : 3838234951 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

An artificial satellite remains in orbit and does not fall on to the earth because

**Options :**

1. ✘ the centrifugal force acting on it balances the gravitational attraction
2. ✘ the on board rocket motors provide continuous boost to keep it in orbit
3. ✔ its transverse velocity keeps it from hitting the earth although it falls continuously
4. ✘ due to its high speed it derives sufficient lift from the rarefied atmosphere

**Question Number : 32 Question Id : 3838234952 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

To transfer a satellite from an elliptical orbit to circular orbit having radius equal to the apogee distance of the elliptical orbit, then the speed of the satellite should be

**Options :**

1. ✔ increased at the apogee

2. ✘ decreased at the apogee
3. ✘ increased at the perigee
4. ✘ decreased at the perigee

**Question Number : 33 Question Id : 3838234953 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The life of geostationary communication satellite is limited by

**Options :**

1. ✘ the working life of on board electronic circuit boards
2. ✘ the time it takes to decay due to atmospheric aerodynamic drag
3. ✔ the quantity of on board fuel available
4. ✘ the number of meteorite hits by the satellite structure

**Question Number : 34 Question Id : 3838234954 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For a given chamber pressure, the thrust of a rocket engine is highest when

**Options :**

1. ✘ the rocket is operating at its design altitude
2. ✔ the rocket is operating in vacuum
3. ✘ the rocket is operating at sea-level
4. ✘ there is a normal shock in the rocket nozzle

**Question Number : 35 Question Id : 3838234955 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A small rocket having a specific impulse of 200s produces a total thrust of 98 kN, out of which 10kN is the pressure thrust. Considering the acceleration due to gravity to be  $9.8 \text{ m/s}^2$ , the propellant mass flow rate in kg/s is

**Options :**

1. ✘ 20
2. ✘ 30
3. ✘ 40
4. ✔ 50

**Question Number : 36 Question Id : 3838234956 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The continuum approach breaks down when the mean free path of the molecules is

**Options :**

1. ✘ the same order of magnitude as the smallest significant length in the problem being investigated
2. ✔ greater than the magnitude as the smallest significant length in the problem being investigated
3. ✘ less than the magnitude as the smallest significant length in the problem being investigated
4. ✘ less than one

**Question Number : 37 Question Id : 3838234957 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The drag due to the pressure distribution around the wing is

**Options :**

1. ✘ skin-friction drag
2. ✘ wave drag
3. ✔ form drag



4. ✘ profile drag

**Question Number : 38 Question Id : 3838234958 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If  $\nabla \times \mathbf{V}$  is equal to zero, then the flow is

**Options :**

1. ✘ Steady
2. ✘ Continuous
3. ✘ Rotational
4. ✔ Irrotational

**Question Number : 39 Question Id : 3838234959 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Circulation is referred to as

**Options :**

1. ✔ Flux of vorticity
2. ✘ Velocity field
3. ✘ Divergence of velocity
4. ✘ Mass flux

**Question Number : 40 Question Id : 3838234960 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Stream function is defined for

**Options :**

1. ✔ 2-D flows
2. ✘ 3-D flows

3. ✘ Complex plane

4. ✘ Irrotational flows

**Question Number : 41 Question Id : 3838234961 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

In a flow, if velocity potential ( $\phi$ ) exists, then the flow is said to be

**Options :**

1. ✘ Rotational

2. ✔ Irrotational

3. ✘ Laminar

4. ✘ Real flow

**Question Number : 42 Question Id : 3838234962 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

When the velocity at the wall is zero, it refers to

**Options :**

1. ✘ Slip condition

2. ✔ No slip condition

3. ✘ Adverse pressure gradient

4. ✘ Favourable pressure gradient

**Question Number : 43 Question Id : 3838234963 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The shape of Rankine oval of equal axes can be found out by substituting

**Options :**

1. ✔  $\Psi = 0$

2. ✘  $\Psi = 1$

3. ✘  $U = 0$

4. ✘  $U = 1$

**Question Number : 44 Question Id : 3838234964 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The profile drag for a two-dimensional aerofoil is

**Options :**

1. ✘ the pressure drag on the profile
2. ✔ the sum of pressure (or form) drag and skin friction drag caused by the viscosity
3. ✘ the sum of form drag and wave drag
4. ✘ drag due to lift

**Question Number : 45 Question Id : 3838234965 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The aerodynamic center on the aerofoil is the point where

**Options :**

1. ✘ pitching moment is equal to zero
2. ✔ pitching moment is independent of the angle of attack
3. ✘ the lift is independent of the angle of attack
4. ✘ the pressure derivative becomes zero

**Question Number : 46 Question Id : 3838234966 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

At low values of incidence, the center of pressure

**Options :**

1. ✓ moves forward with increase in incidence
2. ✗ moves backward with increase in incidence
3. ✗ is at the aerodynamic centre
4. ✗ lies at quarter chord distance

**Question Number : 47 Question Id : 3838234967 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The amount of lift generated in the non-rotating flow over a circular cylinder is

**Options :**

1. ✗ infinity
2. ✗ cannot be predicted
3. ✓ zero
4. ✗ one unit

**Question Number : 48 Question Id : 3838234968 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Kutta-Joukowski theorem is defined for

**Options :**

1. ✓ lift per unit span on the airfoil
2. ✗ drag per unit span on the airfoil
3. ✗ moment per unit span on the airfoil
4. ✗ thrust per unit span on the airfoil

Question Number : 49 Question Id : 3838234969 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The incompressible continuity equation in polar coordinates is written as

Options :

1. ✘  $\frac{q_n}{r} + \frac{\partial q_n}{\partial r} + \frac{1}{r} \frac{\partial q_t}{\partial \theta} = 0$

2. ✘  $\frac{q_t}{r} + \frac{\partial q_t}{\partial r} + \frac{1}{r} \frac{\partial q_n}{\partial \theta} = 0$

3. ✘  $\frac{1}{\theta} \frac{\partial(rq)}{\partial r} + \frac{1}{r} \frac{\partial q}{\partial \theta} = 0$

4. ✔  $\frac{1}{r} \frac{\partial(rq)}{\partial r} + \frac{1}{r} \frac{\partial q}{\partial \theta} = 0$

Question Number : 50 Question Id : 3838234970 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

For Stokes flow the comparison of pressure forces and friction forces acting on any given fluid element shows that

Options :

1. ✔ the pressure forces and friction forces are almost same

2. ✘ the pressure force is much larger than friction forces

3. ✘ the friction force is much larger than pressure forces

4. ✘ the friction force is zero and pressure force is finite

Question Number : 51 Question Id : 3838234971 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The velocity potential  $\phi$  for a vortex flow is given by

Options :

1. ✘

$$-\frac{\Gamma}{2\pi} \ln r$$

2. ✘  $-\frac{\Gamma}{2\pi r}$

3. ✘  $\frac{\Gamma}{2\pi\theta}$

4. ✔  $-\frac{\Gamma}{2\pi} \theta$

**Question Number : 52 Question Id : 3838234972 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

For lifting flow over a cylinder the location of stagnation points when  $\Gamma = 4\pi V_\infty R$  is

**Options :**

1. ✘ one each at third and fourth quadrants on the surface of cylinder
2. ✘ one each at 0 and 180 degree angles on the surface of cylinder
3. ✔ at the bottom of the cylinder i.e., at 270 deg
4. ✘ beneath the cylinder in the flow

**Question Number : 53 Question Id : 3838234973 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

According to Kutta condition, if the trailing edge is cusped, then the velocities leaving the top ( $V_1$ ) and bottom ( $V_2$ ) surfaces at the trailing edge should be

**Options :**

1. ✘  $V_1 = V_2 = 0$
2. ✔  $V_1 = V_2 \neq 0$
3. ✘  $V_1 = V_2 = \text{constant}$

4. ✘  $V_1 = V_2 = \text{infinite}$

Question Number : 54 Question Id : 3838234974 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

In thin airfoil theory the lift curve slope is usually considered as

Options :

1. ✘ 0.10 per degree

2. ✔ 0.11 per degree

3. ✘ 0.09 per degree

4. ✘  $2\pi$  radians

Question Number : 55 Question Id : 3838234975 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

The velocity induced at a point  $P$  by the semi-infinite vortex filament is

Options :

1. ✔  $\frac{\Gamma}{4\pi h}$

2. ✘  $\frac{\Gamma}{2\pi h}$

3. ✘  $\frac{\Gamma}{\pi h}$

4. ✘  $\frac{2\Gamma}{\pi h}$

Question Number : 56 Question Id : 3838234976 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

In a supersonic flow, the indicated Pitot pressure  $p_{02}$  is measured by a Pitot probe for calculating the flow Mach number, which of the following relation is used

Options :

1. ✘ compressible Bernoulli's equation
2. ✘ Prandtl - Glauert rule for supersonic flows
3. ✘ Prandtl relation for normal shock
4. ✔ Rayleigh supersonic Pitot formula

Question Number : 57 Question Id : 3838234977 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

A gas is said to be thermally perfect when

Options :

1. ✘  $p v = R T$
2. ✔ internal energy and enthalpy are functions of temperature alone
3. ✘  $c_v \neq c_v(T)$  and  $c_p \neq c_p(T)$
4. ✘ temperature of the gas is less than 500 K

Question Number : 58 Question Id : 3838234978 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1

For compressible flow, which one of the following is true?

Options :

1. ✘  $\ln\left(\frac{\rho_2}{\rho_1}\right)_{isentropic} \geq \ln\left(\frac{\rho_2}{\rho_1}\right)_{shock}$
2. ✘  $\ln\left(\frac{\rho_2}{\rho_1}\right)_{isentropic} = \ln\left(\frac{\rho_2}{\rho_1}\right)_{shock}$
3. ✘  $\ln\left(\frac{\rho_2}{\rho_1}\right)_{isentropic} \leq \ln\left(\frac{\rho_2}{\rho_1}\right)_{shock}$



4. ✓  $\ln\left(\frac{\rho_2}{\rho_1}\right)_{isentropic} < \ln\left(\frac{\rho_2}{\rho_1}\right)_{shock}$

**Question Number : 59 Question Id : 3838234979 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If the Mach number tends to infinity, what would be the measured density?

**Options :**

1. ✗ Infinity
2. ✗ Zero
3. ✓ 6 times higher than initial density
4. ✗ 0.378 times higher than initial density

**Question Number : 60 Question Id : 3838234980 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The correct statement, for a flow across an oblique shock is

**Options :**

1. ✗ component of velocity normal to shock decreases while tangential component increases
2. ✗ component of velocity normal to shock increases while tangential component decreases
3. ✗ component of velocity normal to shock is preserved while tangential component decreases
4. ✓ component of velocity normal to shock decreases while tangential component is preserved

**Question Number : 61 Question Id : 3838234981 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Which one of the following statements is not true for a supersonic flow?

**Options :**

1. ✗ Over a gradual expansion, entropy remains constant

2. ✘ Over a sharp expansion corner, entropy increases
3. ✔ Over a gradual compression, entropy remains constant
4. ✘ Over a sharp compression corner, entropy increases

**Question Number : 62 Question Id : 3838234982 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The series of shock wave is used to decelerate supersonic flow to subsonic speed, then the variation of the shock waves will be

**Options :**

1. ✘ decreasing half angle from the first to last
2. ✘ constant half angle from the first to last
3. ✔ increasing half angle from the first to last
4. ✘ all shock waves are normal

**Question Number : 63 Question Id : 3838234983 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

When heat is added in a constant area duct without friction (i.e., in Rayleigh flow), which of the following statement is true?

**Options :**

1. ✘ Total temperature and total pressure decreases for both supersonic and subsonic flows at inlet
2. ✔ Total temperature increases and total pressure decreases for both supersonic and subsonic flows at inlet
3. ✘ Total temperature and total pressure increases for supersonic flows at inlet
4. ✘ Total temperature remains constant and total pressure decreases for subsonic flows at inlet

**Question Number : 64 Question Id : 3838234984 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

The Prandtl – Glauert rule gives the relation between

**Options :**

1. ✘ viscous and inviscid flow
2. ✔ compressible and incompressible flow
3. ✘ supersonic and subsonic flow
4. ✘ transonic and subsonic flow

**Question Number : 65 Question Id : 3838234985 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

When  $M_1$  tends to infinity the radius of shock polar is

**Options :**

1. ✔ 1.02
2. ✘ infinity
3. ✘ 2.45
4. ✘ 1.225

**Question Number : 66 Question Id : 3838234986 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1**

Toughness is the ability of the material to absorb energy

**Options :**

1. ✔ till ultimate failure
2. ✘ before yielding fatigue
3. ✘ within the elastic limit
4. ✘ up to the proportionality limit

**Question Number : 67 Question Id : 3838234987 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If a rod tapers uniformly from 30 mm to 15 mm diameter in a length of 350 mm, If it is subjected to an axial load of 5.5 kN and the extension of the rod is 0.025 mm, then the modulus of elasticity of the rod is

**Options :**

1. ✓ 218 GPa
2. ✗ 281 GPa
3. ✗ 4.58 MPa
4. ✗ 458 MPa

**Question Number : 68 Question Id : 3838234988 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A rod of material with Young's Modulus 200 GPa and coefficient of thermal expansion  $\alpha = 0.001$  °C is fixed at both ends and uniformly heated such that the rise in temperature is 50 °C. The stress developed in the rod is

**Options :**

1. ✗ 1000 N/mm<sup>2</sup>
2. ✓ 10000 N/mm<sup>2</sup>
3. ✗ 5000 N/mm<sup>2</sup>
4. ✗ 500 N/mm<sup>2</sup>

**Question Number : 69 Question Id : 3838234989 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In a thick-walled cylinder pressurized from inside, the Hoop stress is maximum at

**Options :**

1. ✓ the inner radius

2. ✘ the centre of the wall thickness
3. ✘ the outer radius
4. ✘ both the inner and outer radii

**Question Number : 70 Question Id : 3838234990 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A simply supported beam is changed to beam with fixed ends. The order of static indeterminacy will

**Options :**

1. ✘ increase by 3
2. ✔ increase by 2
3. ✘ decrease by 1
4. ✘ decrease by 3

**Question Number : 71 Question Id : 3838234991 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If a member is subjected to an axial tensile load then the plane inclined at  $45^\circ$  to the axis of the loading carries

**Options :**

1. ✘ minimum shear stress
2. ✔ maximum shear stress
3. ✘ maximum normal stress
4. ✘ minimum normal stress

**Question Number : 72 Question Id : 3838234992 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The work done in producing strain on a material per unit volume is called

**Options :**

1. ✘ Elasticity
2. ✘ Plasticity
3. ✔ Resilience
4. ✘ Creep

**Question Number : 73 Question Id : 3838234993 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The compatibility conditions in theory of elasticity ensures

**Options :**

1. ✘ the compatibility between stress components
2. ✘ relationships between stresses and strains are consistent with the constitutive relations
3. ✔ displacements are single valued and continuous
4. ✘ stresses satisfy the bi-harmonic equation

**Question Number : 74 Question Id : 3838234994 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The buckling load will be maximum for a column, if

**Options :**

1. ✘ One end of the column is clamped and the other end is free
2. ✔ Both the ends of the column are clamped
3. ✘ Both the ends of the column are hinged
4. ✘ One end of the column is hinged and the other end is free

Question Number : 75 Question Id : 3838234995 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If both ends of a column are fixed, then the effective length of the column is

Options :

1. ✘ its own length
2. ✘ twice its own length
3. ✔ half of its own length
4. ✘ thrice of its own length

Question Number : 76 Question Id : 3838234996 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

In the case of unsymmetrical bending, the resultant deflection of a beam is

Options :

1. ✘ perpendicular to the axis of symmetry
2. ✘ parallel to the axis of symmetry
3. ✔ perpendicular to the neutral axis
4. ✘ parallel to the neutral axis

Question Number : 77 Question Id : 3838234997 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If the load passes through the shear center of the section of a beam, then there will be

Options :

1. ✘ no bending of the beam
2. ✔ only bending
3. ✘ bending and twisting

4. ✘ only twisting

**Question Number : 78 Question Id : 3838234998 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In curved beams the distribution of bending stress is

**Options :**

1. ✘ Linear

2. ✘ Parabolic

3. ✘ Uniform

4. ✔ Hyperbolic

**Question Number : 79 Question Id : 3838234999 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Buckling of the fuselage skin can be delayed by

**Options :**

1. ✔ Increasing internal pressure

2. ✘ Placing stiffeners farther apart

3. ✘ Reducing skin thickness

4. ✘ Placing stiffeners farther and decreasing internal pressure

**Question Number : 80 Question Id : 3838235000 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The shear flow in a thin walled single closed section subjected to torque is defined by

**Options :**

1. ✔  $\frac{T}{2A}$



2. ✘  $\frac{T}{A}$

3. ✘  $\frac{T}{A\theta}$

4. ✘  $\frac{T\theta}{A}$

Question Number : 81 Question Id : 3838235001 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The effective width definition is used for

Options :

1. ✘ Thin walled closed section subjected to bending
2. ✘ Thin walled closed single section subjected to torque
3. ✘ Thin walled multi cell closed section subjected to torque
4. ✔ Sheet stringer panels

Question Number : 82 Question Id : 3838235002 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

The number of independent elastic constants for a 3D anisotropic material are

Options :

1. ✘ 4
2. ✘ 9
3. ✘ 2
4. ✔ 21

Question Number : 83 Question Id : 3838235003 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

**Correct Marks : 1**

If a laminate consists of pairs of layers with identical thickness and elastic properties, but with orientation in opposite sense ( + and - ) with respect to the laminate reference, then the laminate is called

**Options :**

1. ✘ Angle ply laminate
2. ✘ Symmetric angle ply laminate
3. ✘ Cross ply laminate
4. ✔ Balanced laminate

**Question Number : 84 Question Id : 3838235004 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If a mass of 10 kg suspended from a spring, causes a static deflection of 1 cm, then the natural frequency of the system is

**Options :**

1. ✘ 2.98 Hz
2. ✘ 3.98 Hz
3. ✔ 4.98 Hz
4. ✘ 5.98Hz

**Question Number : 85 Question Id : 3838235005 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If the mass matrix is non-diagonal, the coordinates of the system will have

**Options :**

1. ✘ Dynamic coupling
2. ✔ Static coupling
3. ✘ Both static and dynamic coupling

4. ✖ Neither static nor dynamic coupling

Question Number : 86 Question Id : 3838235006 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Which of the following is steady state aero elastic instability?

Options :

1. ✖ Flutter

2. ✖ Buffeting

3. ✔ Divergence

4. ✖ Dynamic response

Question Number : 87 Question Id : 3838235007 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

In vibration isolation system, if  $\omega/\omega_n$  is less than  $\sqrt{2}$ , then for all values of the damping factor, the transmissibility is

Options :

1. ✖ less than unity, but greater than zero

2. ✖ equal to unity

3. ✔ greater than unity

4. ✖ zero

Question Number : 88 Question Id : 3838235008 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

The number of natural frequencies of an elastic beam with cantilever boundary conditions is

Options :

1. ✖ 1

2. ✘ 3

3. ✘ 6

4. ✔ infinite

**Question Number : 89 Question Id : 3838235009 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Which of the following is the extensive property of a thermodynamic system?

**Options :**

1. ✘ Pressure

2. ✔ Volume

3. ✘ Density

4. ✘ Temperature

**Question Number : 90 Question Id : 3838235010 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The unit of thermal conductivity is

**Options :**

1. ✘ W/K

2. ✔ W/mK

3. ✘ W/m<sup>2</sup>K

4. ✘ W/m

**Question Number : 91 Question Id : 3838235011 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Air enters an aircraft engine at a velocity of 180 m/s with a flow rate of 94 kg/s. The engine combustor requires 9.2 kg/s of air to burn 1 kg/s of fuel. The velocity of gas exiting from the engine is 640 m/s. The momentum thrust (in N) developed by the engine is

**Options :**

1. ✘ 47940
2. ✘ 45650
3. ✔ 49779
4. ✘ 42400

**Question Number : 92 Question Id : 3838235012 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Which of the following process ideally represents combustion in gas turbine engines?

**Options :**

1. ✘ Adiabatic
2. ✘ Isentropic
3. ✔ Isobaric
4. ✘ Isochoric

**Question Number : 93 Question Id : 3838235013 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The buzzing instability in the supersonic inlets usually occurs at

**Options :**

1. ✔ Subcritical operation
2. ✘ Critical operation
3. ✘ Supercritical operation
4. ✘ Both critical and supercritical operation

**Question Number : 94 Question Id : 3838235014 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The combustion process in the ramjet engine occurs at

**Options :**

1. ✘ sonic speed
2. ✘ hypersonic speed
3. ✘ supersonic speed
4. ✔ subsonic speed

**Question Number : 95 Question Id : 3838235015 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The optimum expansion in the nozzle occurs when

**Options :**

1. ✘ exit pressure of the nozzle is greater than the atmospheric pressure
2. ✘ exit pressure of the nozzle is less than the atmospheric pressure
3. ✔ exit pressure of the nozzle is equal to the atmospheric pressure
4. ✘ exit pressure is zero

**Question Number : 96 Question Id : 3838235016 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The reduction in work capacity can be accounted by the use of

**Options :**

1. ✘ solidity
2. ✘ diffusion factor

3. ✘ whirling factor

4. ✔ work done factor

**Question Number : 97 Question Id : 3838235017 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In the axial flow compressor, the absolute velocity in the stator

**Options :**

1. ✘ increases

2. ✔ decreases

3. ✘ initially increases and then decreases

4. ✘ remains constant

**Question Number : 98 Question Id : 3838235018 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The ratio of axial velocity to peripheral speed of the blades is

**Options :**

1. ✔ flow coefficient

2. ✘ loading coefficient

3. ✘ rotor enthalpy loss coefficient

4. ✘ rotor pressure loss coefficient

**Question Number : 99 Question Id : 3838235019 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In a multistage axial flow compressor, the axial velocity at higher stage

**Options :**

1. ✘ remains same

2. ✘ high
3. ✔ small
4. ✘ unstable

**Question Number : 100 Question Id : 3838235020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

When compared with centrifugal compressor, the isentropic efficiency of axial flow compressor is

**Options :**

1. ✘ equal
2. ✔ more
3. ✘ less
4. ✘ cannot be compared

**Question Number : 101 Question Id : 3838235021 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A turbine rotor blade is one, which transfers energy

**Options :**

1. ✔ from gases to the turbine rotor
2. ✘ to compressor
3. ✘ from turbine to the rotor gases
4. ✘ there is no energy transfer

**Question Number : 102 Question Id : 3838235022 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**



If the turbine nozzle operates at a higher pressure ratio than the design value, then it is called as

**Options :**

1. ✓ super critical condition
2. ✗ critical condition
3. ✗ subcritical condition
4. ✗ abnormal condition

**Question Number : 103 Question Id : 3838235023 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Multistage reaction turbines are employed to attain

**Options :**

1. ✗ a large volume flow rate
2. ✓ a large pressure drop
3. ✗ a large mass flow rate
4. ✗ a large area

**Question Number : 104 Question Id : 3838235024 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In centrifugal compressor, the outlet casing, which comprises a fluid collector is known as

**Options :**

1. ✗ diffuser
2. ✗ impeller
3. ✗ hub
4. ✓ volute

Question Number : 105 Question Id : 3838235025 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If  $\beta > 90^\circ$ , then the blade shapes are known as

Options :

1. ✘ forward curved blades
2. ✘ radial blades
3. ✔ backward curved blades
4. ✘ straight blades

Question Number : 106 Question Id : 3838235026 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

If there are no guide vanes,  $C_1$  will be radial ( $c_1 = c_{r1}$ ) and  $\alpha_1 = 90^\circ$ , then this

particular condition is expressed as

Options :

1. ✘ pre-whirling
2. ✘ surging
3. ✔ zero whirl
4. ✘ stalling

Question Number : 107 Question Id : 3838235027 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1

Which one of the following blades is more suitable for better efficiency and stable for wider range of operation?

Options :

1. ✘ forward curved blades
2. ✘ radial blades

3. ✓ backward curved blades

4. ✗ straight blades

**Question Number : 108 Question Id : 3838235028 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The ratio of the actual and perfectly guided values of the whirl components at the exit is known as

**Options :**

1. ✗ solidity factor

2. ✗ diffusion factor

3. ✗ whirling factor

4. ✓ slip factor

**Question Number : 109 Question Id : 3838235029 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Choose the correct statement for the rocket engine

**Options :**

1. ✗ thrust decreases with altitude

2. ✗ flight speed always less than jet velocity

3. ✗ rate of climb decreases with altitude

4. ✓ engine has no ram drag

**Question Number : 110 Question Id : 3838235030 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

Which one of the following is not related to solid propellant rocket?

**Options :**

1. ✘ high density
2. ✔ control over oxidizer to fuel ratio (O/F) once ignited
3. ✘ simple in construction
4. ✘ specific impulse in the range of 210–290 s

Question Number : 111 Question Id : 3838235031 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Example for high energy oxidizer is

Options :

1. ✘ liquid oxygen
2. ✘ nitric acid
3. ✔ fluorine
4. ✘ nitrogen tetraoxide

Question Number : 112 Question Id : 3838235032 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1

Total impulse is defined as

Options :

1. ✘ thrust per unit time
2. ✔ thrust integrated over the burning time
3. ✘ thrust integrated over the mass flow rate
4. ✘ thrust per unit mass flow rate

Question Number : 113 Question Id : 3838235033 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

**Correct Marks : 1**

The propellants, which exhibit negative values of burn rate over a certain range of pressure are known as

**Options :**

1. ✘ normal burning
2. ✘ plateau burning
3. ✔ mesa burning
4. ✘ quenching

**Question Number : 114 Question Id : 3838235034 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

In rocket combustion phenomenon, the source that possibly triggers high-frequency pressure-wave instabilities is called

**Options :**

1. ✘ chuffing
2. ✔ popping
3. ✘ bulk mode
4. ✘ screaming

**Question Number : 115 Question Id : 3838235035 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The period from the instant the igniter receives its signal until a portion of the grain surface burns and produces hot gases is called as

**Options :**

1. ✘ flame-spreading interval
2. ✔ ignition time lag
3. ✘ chamber-filling interval

4. ✘ burning time

**Question Number : 116 Question Id : 3838235036 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

The interval from 10% maximum initial pressure (or thrust) to web burnout, with web burnout usually taken as the aft tangent-bisector point on the pressure–time trace is called as

**Options :**

1. ✘ burning rate

2. ✘ ignition time

3. ✘ action time

4. ✔ burning time

**Question Number : 117 Question Id : 3838235037 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A grain in which thrust, pressure and burning surface area increase with burn time is called as

**Options :**

1. ✘ neutral burning

2. ✔ progressive burning

3. ✘ regressive burning

4. ✘ normal burning

**Question Number : 118 Question Id : 3838235038 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

A liquid-propellant rocket engine is used to develop a thrust of 1.5 kN with a characteristic velocity of 1900 m/s at chamber pressure of 5 MPa. If its thrust coefficient  $C_F$  happens to be 1.2, then the throat of nozzle is

**Options :**

1. ✓  $2.5 \times 10^{-4} \text{ m}^2$
2. ✗  $2.5 \times 10^{-3} \text{ m}^2$
3. ✗  $3.2 \times 10^{-4} \text{ m}^2$
4. ✗  $3.6 \times 10^{-4} \text{ m}^2$

**Question Number : 119 Question Id : 3838235039 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

During rocket testing, the characteristic velocity of a choked nozzle with stagnation temperature of 2400 K is ( $\gamma = 1.3$ , M.wt.=28 kg/kmol)

**Options :**

1. ✗ 1565.65 m/s
2. ✗ 1465.65 m/s
3. ✗ 1365.65 m/s
4. ✓ 1265.65 m/s

**Question Number : 120 Question Id : 3838235040 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1**

If a rocket engine produces 30 kN thrust operating at chamber pressure of 4 MPa with throat diameter of 100 mm, then the thrust coefficient of a rocket engine is:

**Options :**

1. ✓ 0.96
2. ✗ 0.85
3. ✗ 0.92

