Telangana State Council Higher Education

Notations :

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

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

Question Paper Name :	Mechanical Engineering 12th Aug 2021 Shift 1
Subject Name :	Mechanical Engineering
Creation Date :	2021-08-12 13:31:22
Duration :	120
Total Marks :	120
Display Marks:	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console? :	Yes

Mechanical Engineering

Group Number :	1
Group Id :	63643125
Group Maximum Duration :	0
Group Minimum Duration :	120
Show Attended Group? :	No

Edit Attended Group? :   No

Break time :   0

Group Marks :   120

Is this Group for Examiner? :   No

Mathematics

Section Id :   63643146

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

Sub-Section Number :   1

Sub-Section Id :   63643146

Question Shuffling Allowed :   Yes

Question Number : 1 Question Id : 6364312881 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If A is a square matrix of order 3, then one of the Eigen values of A is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ -1

4. ✖ 2

The number of solutions of the system of equations:
$x - y + 2z = 3$, $3x + y + 2z = -1$, $x + 2z = 1$ is

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

4. ✔ Infinitely many

$$\lim_{x \to 0} \frac{\sin x - x}{x^3} =$$

Options :

1. ✖ $\dfrac{1}{6}$

2. ✔ $\dfrac{-1}{6}$

3. ✘ $\dfrac{1}{3}$

4. ✘ $\dfrac{-1}{3}$

Question Number : 4 Question Id : 6364312884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The directional derivative of $\phi = xyz$ at the point $(1, -1, 1)$ in the direction of the vector $i + j + k$ is

Options :

1. ✘ $\dfrac{-1}{3}$

2. ✘ $\dfrac{4}{\sqrt{3}}$

3. ✘ $\dfrac{2}{\sqrt{3}}$

4. ✔ $\dfrac{-1}{\sqrt{3}}$

Question Number : 5 Question Id : 6364312885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Laplace transform of $e^{t}\sinh t$ is

Options :

1. ✖ $\dfrac{1}{s^2+2s}$

2. ✖ $\dfrac{s}{(s+1)^2-1}$

3. ✔ $\dfrac{1}{s^2-2s}$

4. ✖ $\dfrac{s}{(s-1)^2-1}$

Question Number : 6 Question Id : 6364312886 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The particular integral of $y'' + y = 1 + x + x^2$ is

Options :

1. ✗ $x^2 + x + 1$

2. ✓ $x^2 + x - 1$

3. ✗ $x^2 + x$

4. ✗ $x^2 + x + 2$

Question Number : 7 Question Id : 6364312887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\int_{|z|=4} \frac{z^2}{\sin^2 z} dz =$$

Options :

1. ✓ 0

2. ✗ πi

3. ✗ $2\pi i$

4. ✖ $-\pi i$

Question Number : 8 Question Id : 6364312888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let A, B and C be three mutually exclusive and exhaustive events such that $P(B) = \frac{2}{3} P(A)$ and $P(C) = \frac{3}{2} P(B)$. Then $P(A \cup C) =$

Options :

1. ✖ $\frac{2}{5}$

2. ✖ $\frac{2}{3}$

3. ✖ $\frac{3}{5}$

4. ✔ $\frac{3}{4}$

Question Number : 9 Question Id : 6364312889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Under usual notations $(1+\Delta)(1-\nabla) =$

Options :

1. ✔ 1

2. ✘ 2

3. ✘ 3

4. ✘ 4

Question Number : 10 Question Id : 6364312890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If C is the curve $9x^2 + 4y^2 = 36$, then $\int_C \left(2xy+2y^2\right) dx + \left(x^2+4xy+2x\right) dy =$

Options :

1. ✘ 6π

2. ✘ 10π

3. ✔ 12π

4. ✘ 18π

Mechanical Engineering

Section Id :	63643147
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
Sub-Section Number :	1
Sub-Section Id :	63643147
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 6364312891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In accordance to Varignon's theorem, the algebraic sum of moments of the two forces about any point in their plane is equal to

Options :

1. ✖ Zero

2. ✖ The moments of the minimum force about the same point

3. ✖ The moments of the maximum force about the same point

4. ✔ The moments of their resultant about the same point

Question Number : 12 Question Id : 6364312892 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The road roller is to be pulled over an obstacle (refer figure below).
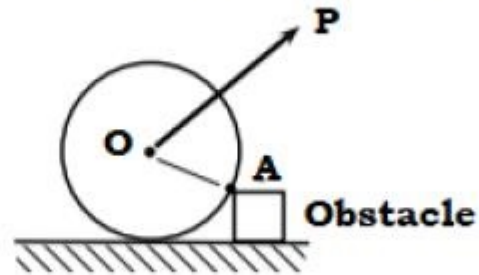
The magnitude of force **P** required, will be the minimum when it is

Options :

1. ✗ Horizontal

2. ✗ Vertical

3. ✗ At 45^0 to the horizontal

4. ✔ Perpendicular to the line AO

Question Number : 13 Question Id : 6364312893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The principle of virtual work states that the work done on a rigid body or a system of rigid bodies for any virtual displacements compatible with the constraints on the system in equilibrium is

Options :

1. ✔ Zero

2. ✖ Maximum

3. ✖ Minimum

4. ✖ Non-zero

Question Number : 14 Question Id : 6364312894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a statically determinate plane truss, the relation between the number of members (n) and number of joints (j) is expressed by
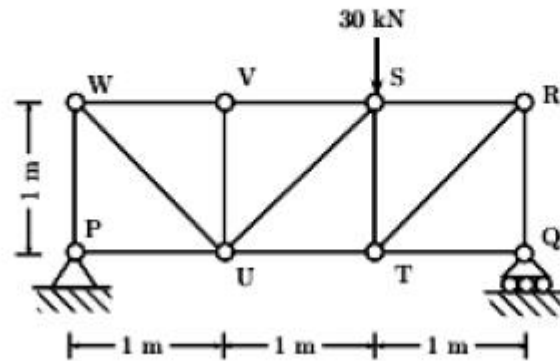
Options :

1. ✖ $n = 2j+1$

2. ✖ $n = 2j+3$

3. ✔ $n = 2j-3$

4. ✗ $n = 2j-1$

Question Number : 15 Question Id : 6364312895 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the truss shown in figure below, the magnitude of the force in the member RS is

Options :

1. ✗ 10

2. ✓ 20

3. ✗ $10\sqrt{2}$

4. ✗ $20\sqrt{2}$

Question Number : 16 Question Id : 6364312896 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

A bullet is fired in vertically upward direction from a rifle, with a velocity of 110 m/s from the top of a 115 m high building. Assuming g = 10 m/s², the velocity with which the bullet will hit the ground is (in m/s)

Options :

1. ✖ 175

2. ✖ 150

3. ✖ 125

4. ✔ 120

A constant force **F** is applied on a body of mass **m** for time **t**, and as a result the velocity of body changes from **u** to **v** under an acceleration **a** (all in the same direction). Then for the equilibrium of the body which of the following is true

Options :

1. ✖ $F = mu/t$

2. ✖ $F = mv/t$

3. ✔ $F = m\,(v-u)/t$

4. ✖ $F = m\,(v+u)/t$

Question Number : 18 Question Id : 6364312898 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A wooden block is resting on an inclined plane. The block starts to slide down the plane as the inclination angle of the plane is gradually increased to 30^0. The coefficient of friction between the wooden block and the plane is

Options :

1. ✔ $\dfrac{1}{\sqrt{3}}$

2. ✖ $\dfrac{\sqrt{3}}{2}$

3. ✖ $\sqrt{3}$

4. ✖ 0.50

Question Number : 19 Question Id : 6364312899 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a perfectly incompressible linear elastic material, the value of Poisson's ratio is
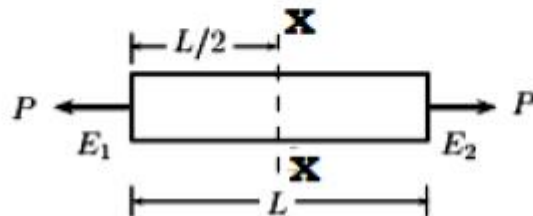
Options :

1. ✗ 1

2. ✗ 0

3. ✔ 0.5

4. ✗ Infinity

Question Number : 20 Question Id : 6364312900 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An axially loaded bar (refer figure below) has length L and uniform cross-sectional area A. If the Young's modulus of the material increases linearly from E_1 to E_2 along the length of the bar, the normal stress developed at the section XX is

Options :

1. ✔ $\dfrac{P}{A}$

2. ✘ $\dfrac{P(E_1-E_2)}{A(E_1+E_2)}$

3. ✘ $\dfrac{PE_2}{AE_1}$

4. ✘ $\dfrac{PE_1}{AE_2}$

Question Number : 21 Question Id : 6364312901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the principal stresses in a plane stress problem are $\sigma_1 = 100$ MPa, $\sigma_2 = 30$ MPa, the magnitude of the maximum shear stress will be

Options :

1. ✔ 35 MPa

2. ✘ 65 MPa

3. ✘ 50 MPa

4. ✖ 15 MPa

Question Number : 22 Question Id : 6364312902 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In case of column, the equivalent length is equal to the actual length of a column with

Options :

1. ✖ One end fixed and other end free

2. ✖ Both ends fixed

3. ✖ One end fixed and other end hinged

4. ✔ Both ends hinged

Question Number : 23 Question Id : 6364312903 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A cantilever beam of length L carries a uniformly distributed load over it's entire length. The shear force diagram will be
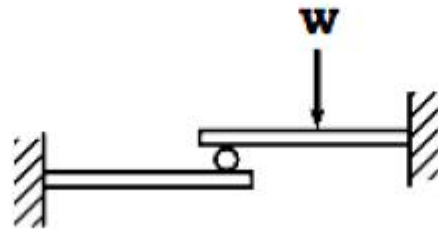
Options :

1. ✖ A rectangle

2. ✔ A triangle

3. ✘ Two equal and opposite triangles

4. ✘ Two equal and opposite rectangles

Question Number : 24 Question Id : 6364312904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two identical cantilevers beams, as shown in the figure below, are supported with their free ends in contact with a rigid roller. After a load **W** is applied, the free ends will have

Options :

1. ✔ Equal deflections, but not equal slopes

2. ✘ Equal slopes, but not equal deflections

3. ✘ Equal slopes as well as equal deflections

4. ✖ Neither equal slopes nor equal deflections

Question Number : 25 Question Id : 6364312905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two solid circular shafts **S1** and **S2** have radii 10 mm and 20 mm, respectively and are subjected to the same torque **T**. The ratio of maximum shear stresses developed in shaft **S1** and **S2** will be

Options :

1. ✖ 4

2. ✔ 8

3. ✖ 0.25

4. ✖ 0.125

Question Number : 26 Question Id : 6364312906 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A thin cylinder having inner and outer diameters of 1.0 m and 1.02 m, respectively, is subjected to an internal pressure of 8 MPa. The average circumferential stress developed in the cylinder is

Options :

1. ✗ 200 MPa

2. ✓ 400 MPa

3. ✗ 800MPa

4. ✗ 100 MPa

Question Number : 27 Question Id : 6364312907 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Izod test is used to determine the _____ of a material

Options :

1. ✓ Toughness

2. ✗ Resilience

3. ✗ Hardness

4. ✗ Fatigue strength

Question Number : 28 Question Id : 6364312908 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A Hartnell governor has its controlling force **F** is given by the equation $\mathbf{F} = \mathbf{A} + \mathbf{Br}$, where **r** is the radius of the balls and **A** & **B** are constants. The governor becomes isochronous when

Options :

1. ✖ A is negative and B is positive

2. ✖ A positive and B is negative

3. ✖ A is positive and B is zero

4. ✔ A is Zero and B is positive

Question Number : 29 Question Id : 6364312909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
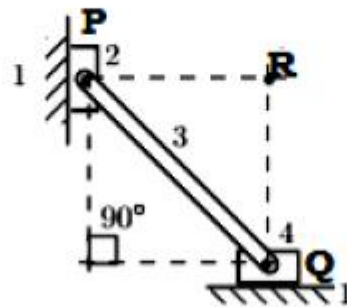
Correct Marks : 1 Wrong Marks : 0

The figure shown below depicts a planar mechanism with a single degree of freedom.

The instantaneous center I_{24} for the above configuration will be located at
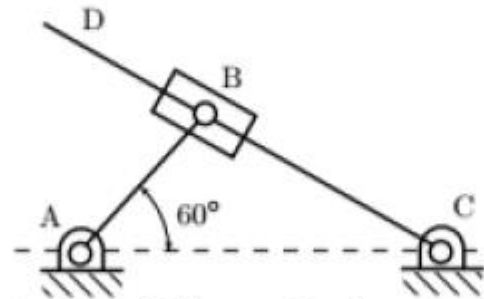
Options :

1. ✖ P

2. ✖ Q

3. ✖ R

4. ✔ ∞

Question Number : 30 Question Id : 6364312910 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the mechanism shown in figure below, the angular velocity of link AB is 10 rad/s counterclockwise (Given: AB=250 mm, BC=250$\sqrt{3}$ mm and AC=500 mm).

The magnitude of the relative sliding velocity of slider B with respect to rigid link CD is

Options :

1. ✖ 5.0 m/s

2. ✖ 2.5$\sqrt{3}$ m/s

1.25 m/s

3. ✖

2.5 m/s

4. ✔

Question Number : 31 Question Id : 6364312911 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A pinion having 19 tooth is in mesh with a gear having 37 tooth. The profile of the gear tooth is 20^0 full depth involute. If the module is 10 mm, the center distance between the gear pair will be

Options :

140 mm

1. ✖

280 mm

2. ✔

560 mm

3. ✖

90 mm

4. ✖

Question Number : 32 Question Id : 6364312912 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The speed of an engine varies from 220 rad/s to 180 rad/s. During a cycle, the change in kinetic energy is found to be 800 Nm. The inertia of the flywheel is

Options :

1. ✖ 0.05 kg-m^2

2. ✔ 0.10 kg-m^2

3. ✖ 0.20 kg-m^2

4. ✖ 0.40 kg-m^2

Question Number : 33 Question Id : 6364312913 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the Gear train shown in below figure. If Gear 2 rotates at 800 rpm in counter-clockwise direction and engages with Gear 3. Gear 3 and Gear 4 are mounted on the same shaft. Gear 5 engages with Gear 4.
The angular speed of Gear 5 is
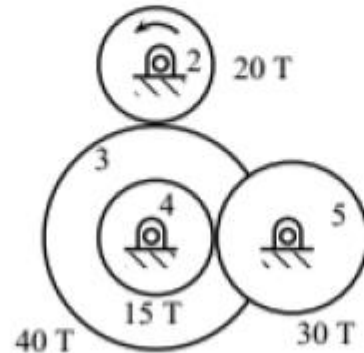
Note: T represents no. of teeth.

Options :

1. ✔ 200 rpm counterclockwise

2. ✖ 200 rpm clockwise

3. ✖ 3200 rpm counterclockwise

4. ✖ 3200 rpm clockwise

Question Number : 34 Question Id : 6364312914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

If a centrifugal governor is operating between the maximum and minimum speed limits N_1 and N_2, respectively. Then the sensitivity of the governor is expressed by

Options :

1. ✖ $\dfrac{(N_1+N_2)}{2N_1 N_2}$

2. ✖ $\dfrac{(N_1-N_2)}{2N_1 N_2}$

3. ✖ $\dfrac{2(N_1+N_2)}{(N_1-N_2)}$

4. ✔ $\dfrac{2(N_1-N_2)}{(N_1+N_2)}$

Question Number : 35 Question Id : 6364312915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Static balancing is satisfactory for low speed rotors, but with the increase in speed, dynamic balancing becomes essential. This is because,

Options :

1. ✖ The unbalanced couples are caused only at higher speeds

2. ✖ The unbalanced forces are dangerous at higher speeds

3. ✔ The effects of unbalances are proportional to the square of the speed

4. ✖ The effects of unbalances are directly proportional to the speed

Question Number : 36 Question Id : 6364312916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The effect of gyroscopic couple acting on a ship, when it is pitching upward and the rotor of turbine rotates anti-clock wise when viewed from bow, will be

Options :

1. ✖ To move the ship towards the port side

2. ✔ To move the ship towards star-board

3. ✖ To raise the bow and lower the stern

4. ✖ To raise the stern and lower the bow

Question Number : 37 Question Id : 6364312917 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The natural frequency of a simple spring mass vibrating system is N. If stiffness of the spring is halved and its' mass is doubled, then the natural frequency becomes

Options :

1. ✔ N/2

2. ✖ 2N

3. ✖ 4N

4. ✖ 8N

Question Number : 38 Question Id : 6364312918 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A vibrating machine is isolated from the floor by employing springs. If the ratio of excitation frequency of vibration of the machine to the natural frequency of the isolation system is 0.5, the transmissibility of ratio of isolation is

Options :

1. ✖ 3/4

2. ✖ 2

3. ✔ 4/3

4. ✖ $1/2$

Question Number : 39 Question Id : 6364312919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A single degree-of-freedom system with viscous damping is excited by a harmonic force. The phase angle of the displacement with respect to the exciting force at resonance will be

Options :

1. ✖ 0^0

2. ✖ 45^0

3. ✔ 90^0

4. ✖ 135^0

Question Number : 40 Question Id : 6364312920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a single degree of freedom mass–spring–viscous damper system, having mass m, spring constant k and viscous damping coefficient q, is critically damped. Then the correct relationship between m, k and q is

Options :

1. ✔ $q = 2\sqrt{km}$

2. ✘ $q = \sqrt{2km}$

3. ✘ $q = \sqrt{\dfrac{2k}{m}}$

4. ✘ $q = 2\sqrt{\dfrac{k}{m}}$

Question Number : 41 Question Id : 6364312921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Whirling speed of a shaft coincides with the natural frequency of its'

Options :

1. ✘ Torsional vibration

2. ✔ Transverse vibration

3. ✘ Longitudinal vibration

4. ✘ Coupled bending and Torsional vibration

Question Number : 42 Question Id : 6364312922 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

By performing the tensile test, the yield strength of steel is found to be 200 MPa. Using a factor of safety of 2 and applying maximum principal stress theory of failure, the permissible stress in the steel shaft subjected to torque will be

Options :

1. ✖ 50 MPa

2. ✖ $\dfrac{100}{\sqrt{3}}$ MPa

3. ✖ $50\sqrt{3}$ MPa

4. ✔ 100 MPa

Question Number : 43 Question Id : 6364312923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Amongst various fatigue failure criteria, the most conservative criterion is

Options :

1. ✔ Soderberg

2. ✖ Modified Goodman

3. ✖ ASME elliptic

4. ✖ Gerber

Question Number : 44 Question Id : 6364312924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In general, to estimate the endurance strength (σ_e) of a material for a desired finite life cycle (N), which of the following curve is used

Options :

1. ✖ $\ln \sigma$ vs $\ln N$

2. ✖ σ vs $\ln N$

3. ✖ $\log_{10} \sigma$ vs $\log_{10} N$

4. ✔ σ vs $\log_{10} N$

Question Number : 45 Question Id : 6364312925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A double riveted double strap butt joint between two plates, each 20 mm thick, is made with 25 mm diameter rivet at 100 mm pitch. Assuming the permissible stresses in tension, shear and crushing as 120 MPa, 100 MPa and 150 MPa, respectively. The crushing resistance of the rivet will be

Options :

1. ✓ 150 kN

2. ✗ 120 kN

3. ✗ 100 kN

4. ✗ 75 kN

Question Number : 46 Question Id : 6364312926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

While designing a plate clutch, the assumption of uniform wear is made because

Options :

1. ✓ It is closer to real life situation

2. ✗ It leads to a safer design

3. ✗ It leads to cost effective design

4. ✖ No other assumption is possible

Question Number : 47 Question Id : 6364312927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During the formulation of Lewis equation for toothed gearing, the tangential tooth load F_t is assumed to act on the

Options :

1. ✖ Root of the tooth

2. ✔ Tip of the tooth

3. ✖ Pitch point

4. ✖ Whole face of the tooth

Question Number : 48 Question Id : 6364312928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the design of hydrodynamic journal bearings which of the following criterion is considered

Options :

1. ✔ Sommerfeld number

2. ✖ Rating life

3. ✖ Specific dynamic capacity

4. ✖ Rotation factor

Question Number : 49 Question Id : 6364312929 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In eccentrically loaded welded joints, the shear stress assumed to be uniformly distributed over the throat area of all the welds is known as

Options :

1. ✔ Primary shear stress

2. ✖ Secondary shear stress

3. ✖ Tertiary shear stress

4. ✖ Resultant shear stress

Question Number : 50 Question Id : 6364312930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A solid steel shaft having diameter d is subjected to a combined torque T and bending moment M. For the design of shaft using the relation $\frac{16}{\pi d^3}\sqrt{M^2 + T^2}$, which of the following property of steel is used

Options :

1. ✖ Ultimate tensile strength

2. ✔ Torsional yield strength

3. ✖ Tensile yield strength

4. ✖ Endurance strength

Question Number : 51 Question Id : 6364312931 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The consideration of Wahl's stress factor while designing helical springs accounts for

Options :

1. ✖ Direct shear stress

2. ✖ Curvature effect

3. ✖ Torsional shear stress

4. ✔ Effect of direct shear and curvature

Question Number : 52 Question Id : 6364312932 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the context of Newtonian fluids, which of the following is correct

Options :

1. ✖ Rate of shear stress is proportional to shear strain

2. ✖ Shear stress is proportional to shear strain

3. ✔ Shear stress is proportional to the rate of shear strain

4. ✖ Rate of shear stress is proportional to the rate of shear strain

Question Number : 53 Question Id : 6364312933 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is unit of dynamic viscosity

Options :

1. ✔ N-sec/m^2

2. ✖ kgf-sec/m

3. ✖ N-sec/m

4. ✖ N-sec^2/m

Question Number : 54 Question Id : 6364312934 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a floating body is under the influence of gravity alone, which of the following is TRUE for stability

Options :

1. ✖ Metacentre should be below the center of gravity

2. ✔ Metacentre should be above the center of gravity

3. ✖ Metacentre and center of gravity must lie on the same vertical line

4. ✖ Metacentre and the center of gravity must lie on the same horizontal

Question Number : 55 Question Id : 6364312935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a fluid field, a stream line is an imaginary line

Options :

1. ✖ Which is along the path of the particle

2. ✖ Which is always parallel to the main direction of flow

3. ✖ Along which there is no flow

4. ✔ On which tangent drawn at any point gives the direction of the velocity

Question Number : 56 Question Id : 6364312936 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The continuity equation
$$\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$$
is valid only for

Options :

1. ✖ Incompressible fluid whether the flow is steady or not

2. ✖ Steady flow, whether it is compressible or not

3. ✔ Steady flow and incompressible fluids

4. ✖ Ideal fluid flow

Question Number : 57 Question Id : 6364312937 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Bernoulli's equation given below (where symbols have their usual meaning)

$$\frac{p}{\rho g} + \frac{v^2}{2g} + h = c$$

is applicable for

Options :

1. ✔ Steady, frictionless, and incompressible flow along a streamline

2. ✖ Uniform and frictionless flow along a streamline when ρ is a function of p

3. ✖ Steady and frictionless flow along a streamline when ρ is a function of p

4. ✖ Steady, uniform, and incompressible flow along a streamline

Question Number : 58 Question Id : 6364312938 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A fluid jet discharging from a 50 mm diameter orifice has 30 mm diameter at its vena contracta. Its coefficient of contraction will be
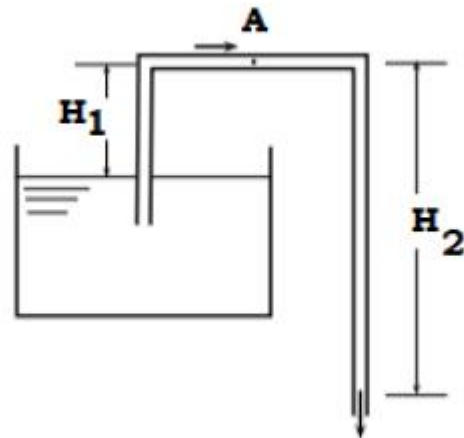
Options :

1. ✖ 0.18

2. ✔ 0.36

3. ✖ 0.60

4. ✖ 0.769

Question Number : 59 Question Id : 6364312939 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A siphon draws water from a reservoir and discharges it out at atmospheric pressure.

Assuming that the fluid is ideal and the reservoir is large, the velocity at point **A** in the siphon tube is:

Options :

1. ✖ $\sqrt{2g(H_2 + H_1)}$

2. ✔ $\sqrt{2g(H_2 - H_1)}$

3. ✖ $\sqrt{2gH_1}$

4. ✖ $\sqrt{2gH_2}$

Question Number : 60 Question Id : 6364312940 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Reynolds number for a steady laminar incompressible axi-symmetric fully developed viscous flow through a straight, circular pipe, having a constant cross sectional area, is 6. The ratio of inertia force to the viscous force on a fluid particle will be

Options :

1. ✔ 6

2. ✖ 1/6

3. ✖ 0

4. ✖ ∞

Question Number : 61 Question Id : 6364312941 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The head loss for a laminar incompressible fluid flow through a horizontal circular pipe is h_1. Assuming the same pipe length and the same fluid, if the average flow velocity is doubled and the pipe diameter is reduced by 50%, the head loss is noticed to be h_2. The ratio of h_2/h_1 will be

Options :

1. ✖ 0.125

2. ✖ 0.25

3. ✖ 4

4. ✔ 8

Question Number : 62 Question Id : 6364312942 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A composite wall of a furnace has three layers, each having the same thickness. The ratio of thermal conductivities of theses layers is 1:3:6. The ratio of temperature drop across the three respective layers will be

Options :

1. ✖ 1:3:6

2. ✔ 6:2:1

3. ✘ 6:3:1

4. ✘ log6:log2:log1

Question Number : 63 Question Id : 6364312943 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A metal rod, having diameter 20 mm and conductivity 40W/mK, is required to be insulated by using an insulating material of conductivity 0.1 W/mK. If the convective heat transfer coefficient with the ambient atmosphere is 5 W/m^{2}K, then the critical thickness of insulation (in mm) will be

Options :

1. ✘ 50

2. ✘ 30

3. ✘ 20

4. ✔ 10

Question Number : 64 Question Id : 6364312944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

For more effective heat transfer from a given surface, it is recommended to use

Options :

1. ✖ Fewer number of thin fins

2. ✖ Fewer number of thick fins

3. ✖ Large number of thick fins

4. ✔ Large number of thin fins

Question Number : 65 Question Id : 6364312945 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The heat transfer coefficient from a 120 mm diameter steel pipe placed horizontally in ambient air at 25^0C will be _____. Assume: Nusselt number = 30 and thermal conductivity of air = 0.05 W/mK

Options :

1. ✖ 6.25 W/m²K

2. ✖ 25 W/m²K

3. ✔ 12.5 W/m²K

4. ✘ 50 W/m²K

Question Number : 66 Question Id : 6364312946 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a heat exchanger, the hot liquid enters with a temperature of 180°C and leaves at 140°C. The cooling fluid enters at 40°C and leaves at 120°C. The capacity ratio of the heat exchanger is

Options :

1. ✘ 0.25

2. ✔ 0.50

3. ✘ 0.30

4. ✘ 0.60

Question Number : 67 Question Id : 6364312947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The ratio of kinematics viscosity to thermal diffusivity is a dimensionless number termed as

Options :

1. ✔ Prandtl number

2. ✖ Grashof number
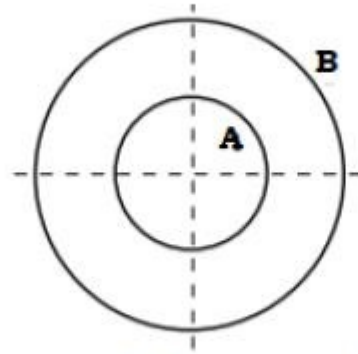
3. ✖ Mach number

4. ✖ Nusselt number

Question Number : 68 Question Id : 6364312948 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the temperature of a solid surface is increased from 27^OC to 327^OC, then its emissive power will increase by

Options :

1. ✖ 32 times

2. ✔ 16 times

3. ✖ 8 times

4. ✖ 4 times

Question Number : 69 Question Id : 6364312949 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Consider two infinitely long, thin concentric circular tubes as shown in the figure below:

If D_1 and D_2 are the diameters of the inner and outer tubes, respectively, then the view factor F_{BB} is given by

Options :

1. ✔ $1-D_1/D_2$

2. ✖ $D_2/D_1 - 1$

3. ✖   Zero

4. ✖ $1-D_2/D_1$

Two long parallel surfaces have an emissivity of 0.85 each. Then in order to reduce the radiation heat exchange by 80%, the required number of thin parallel shields of equal emissivity (0.85) will be

Options :

1. ✖   2

2. ✔   4

3. ✖   6

4. ✖   8

Question Number : 71 Question Id : 6364312951 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following thermodynamic system is an example of Ice kept in a perfectly insulated container
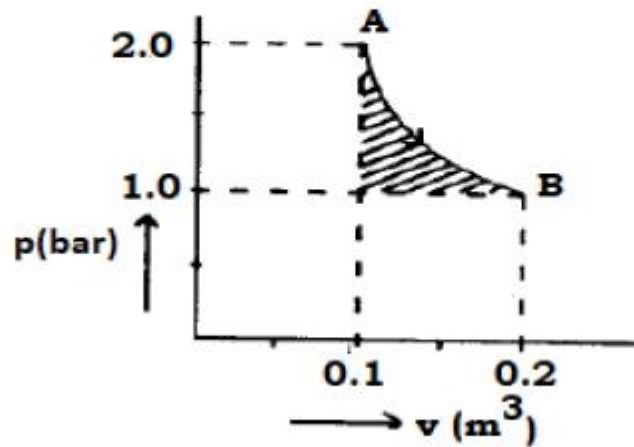
Options :

1. ✖   Non-flow adiabatic system

2. ✖   Closed system

3. ✖   Open system

Isolated systems

4. ✔

An ideal gas undergoes an isothermal expansion from state **A** to state **B** in a turbine, as depicted in *p-v* diagram below. The area of the shaded region (refer *p-v* diagram) is 2000 Nm.

What is the amount is turbine work done during the process

Options :

1. ✖ 11,000 Nm

2. ✔ 12,000 Nm

3. ✗ 10,000 Nm

4. ✗ 14,000 Nm

Question Number : 73 Question Id : 6364312953 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two engines **A** and **B** have equal efficiency. The operating temperature limits for engine **A** are **1600 K** and T_2, for engine **B** the temperatures are T_2 and **400 K**. The value of temperature T_2 will be

Options :

1. ✔ 800 K

2. ✗ 1000 K

3. ✗ 600 K

4. ✗ 750 K

Question Number : 74 Question Id : 6364312954 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Unit mass of a fluid is kept at room temperature. If the fluid is brought into contact with a thermal reservoir, which has a temperature higher than the room temperature, then the entropy change of the universe will be

Options :

1. ✖ Equal to zero

2. ✔ Always positive

3. ✖ Equal to entropy change of the reservoir

4. ✖ Equal to entropy change of water

Question Number : 75 Question Id : 6364312955 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A gas power plant is working on the Brayton cycle between the maximum and minimum temperature limits of T_{max} and T_{min}, respectively. For maximum work output from the power plant, the compression ratio (r) will be given by

Options :

1. ✔ $\left(\dfrac{T_{max}}{T_{min}}\right)^{\frac{\gamma}{2(\gamma-1)}}$

2. ✖ $\left(\dfrac{T_{max}}{T_{min}}\right)^{\frac{\gamma}{2(\gamma+1)}}$

3. ✖ $\left(\dfrac{T_{max}}{T_{min}}\right)^{\frac{2\gamma}{(\gamma-1)}}$

4. ✖ $\left(\dfrac{T_{max}}{T_{min}}\right)^{\frac{2\gamma}{(\gamma+1)}}$

Question Number : 76 Question Id : 6364312956 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A heat pump is operating between the temperatures of $27^{0}C$ and $13^{0}C$. The rates of heat addition and heat rejection are 800W and 1000W, respectively. The COP for the heat pump is

Options :

1. ✖ 7.5

2. ✖ 6.5

3. ✔ 5.0

4. ✖ 4.0

Question Number : 77 Question Id : 6364312957 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The efficiency of the Diesel cycle approaches to that of the Otto cycle when

Options :

1. ✖ Cut-off ratio increases

2. ✔ Cut-off ratio is zero

3. ✖ Cut-off ratio decreases

4. ✖ Cut-off ratio is constant

Question Number : 78 Question Id : 6364312958 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The compression work done per kg of air in a reciprocating compressor

Options :

1. ✖ Increases with the increase in clearance volume

2. ✖ Decreases with the increase in clearance volume

3. ✔ Is independent of clearance volume

4. ✖ Increases with the decrease in clearance volume

Question Number : 79 Question Id : 6364312959 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a certain application, it is required to condition the outside air from 65% RH and 47^0C dry bulb to 45% RH and 28^0C dry bulb condition. The practical arrangement made will be termed as

Options :

1. ✖ Dehumidification

2. ✖ Cooling and humidification

3. ✖ Dehumidification and pure sensible cooling

4. ✔ Cooling and dehumidification

Question Number : 80 Question Id : 6364312960 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of jets required for the operation of Pelton turbine depends upon the

Options :

1. ✖ Head of water

2. ✖ Total quantity of water

3. ✔ Specific speed

4. ✖ Number of buckets

Question Number : 81 Question Id : 6364312961 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The following property is most important for material used for gas turbine blade

Options :

1. ✖ Toughness

2. ✖ Fatigue

3. ✔ Creep

4. ✖ Corrosion resistance

Question Number : 82 Question Id : 6364312962 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a given set of operating pressure limits of a Rankine cycle, the highest efficiency occurs for

Options :

1. ✖ Saturated cycle

2. ✖ Superheated cycle

3. ✖ Reheat cycle

4. ✔ Regenerative cycle

Question Number : 83 Question Id : 6364312963 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of following unit cells has the highest atomic packing factor (APF)

Options :

1. ✔ Hexagonal close-packed

2. ✖ Body-centered cubic

3. ✖ Diamond cubic

4. ✖ Simple cubic

Question Number : 84 Question Id : 6364312964 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following stress-strain (*i.e.* σ-ε) diagrams best represents the behavior of brittle materials, such as ceramics and cast iron (σ = stress, ε = strain)
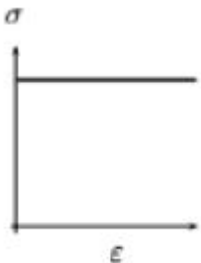
Options :

1. ✖

2. ✖

3. ✖

4. ✔

Question Number : 85 Question Id : 6364312965 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the heat treatment processes (mentioned in Group A) and their effects on the properties (mentioned Group B) of medium carbon steel

Group A

P. Tempering
Q. Quenching
R. Annealing
S. Normalizing

Group B

1. Strengthening and grain refinement
2. Inducing toughness
3. Hardening
4. Softening

Options :

1. ✖   P - 3, Q - 4, R - 2, S - 1

2. ✖   P - 3, Q - 2, R - 4, S - 1

3. ✖   P - 2, Q - 3, R - 1, S - 4

4. ✔ P - 2, Q - 3, R - 4, S - 1

Question Number : 86 Question Id : 6364312966 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Plain carbon steels are susceptible to heat treatment processes due to the presence of following invariant reaction the Fe-Fe$_3$C system

Options :

1. ✖ Eutectic

2. ✔ Eutectoid

3. ✖ Peritecttic

4. ✖ Peritectoid

Question Number : 87 Question Id : 6364312967 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The primary objective of spheroidizing treatment of steel is to improve

Options :

1. ✖ Hardenability of high carbon steels

2. ✖ Machinability of low carbon steels

3. ✔ Machinability of high carbon steels

4. ✖ Hardenability of low carbon steels

Question Number : 88 Question Id : 6364312968 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Low carbon steel having 0.15 wt.% of carbon can be hardened by

Options :

1. ✖ Hardening

2. ✖ Flame hardening

3. ✔ Cyaniding

4. ✖ Austempering

Question Number : 89 Question Id : 6364312969 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The purpose of providing shrinkage allowance on the pattern is to compensate for shrinkage when the temperature of

Options :

1. ✖ Liquid metal drops from pouring to freezing temperature

2. ✖ Metal changes from liquid to solid state at freezing temperature

3. ✖ Metal drops from pouring to room temperature

4. ✔ Solid phase drops from freezing to room temperature

Question Number : 90 Question Id : 6364312970 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In die casting the most common defect "misrun" occurs due to

Options :

1. ✖ Quite high pouring temperature of the metal

2. ✔ Low fluidity of the molten metal

3. ✖ Absorption of gases by the liquid metal

4. ✖ Misalignment of the mold flasks

Question Number : 91 Question Id : 6364312971 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In order to accurately design the size of a riser, which of the following is helpful

Options :

1. ✖ Bernoulli's equation

2. ✖ Continuity equation

3. ✖ Newton's law of viscosity

4. ✔ Chvorinov's rule

Question Number : 92 Question Id : 6364312972 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In investment casting, the patterns are made of

Options :

1. ✔ Wax with polystyrene filler

2. ✖ Synthetic sand

3. ✖ Special plastics

4. ✖ Thermosetting resin

Question Number : 93 Question Id : 6364312973 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

In general, the cold working operations are usually performed in several steps, with intermediate annealing operations to

Options :

1. ✖ Bring back the metal to recrystallization temperature

2. ✖ Strengthen the cold worked metal to avoid fracture

3. ✔ Soften the cold worked metal to restore the ductility

4. ✖ Increase the grain size of metal

The force required in a blanking operation of the steel sheet is 5.0 kN. The thickness of the sheet is **t** and the diameter of the blanked part is **d**. For the same material, if the diameter of the blanked part is increased by 60% and the thickness is reduced by 50%, the blanking force required will be

Options :

1. ✖ 8.0 kN

2. ✖ 3.0 kN

3. ✗   2.5 kN

4. ✓   4.0 kN

Question Number : 95 Question Id : 6364312975 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following metal forming processes (Column-A) with their associated stresses (Column-B) in the work piece.

Column-A: Metal forming process

1. Coining
2. Wire Drawing
3. Blanking
4. Deep Drawing

Column-B: Types of stress
P. Tensile
Q. Shear
R. Tensile and compressive
S. Compressive

Options :

1. ✓   1 - S, 2 - P, 3 - Q, 4 - R

2. ✗   1 - S, 2 - P, 3 - R, 4 - Q

3. ✗   1 - P, 2 - Q, 3 - S, 4 - R

4. ✗   1 - P, 2 - R, 3 - Q, 4 - S

Question Number : 96 Question Id : 6364312976 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During the manufacturing of a bush by powder metallurgy process, which of the following operation improves the bearing property of the bush

Options :

1. ✖ Infiltration

2. ✔ Impregnation

3. ✖ Compacting

4. ✖ Sintering

Question Number : 97 Question Id : 6364312977 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a fusion welding process, the Heat Affected Zone (HAZ) is the region where the work material undergoes

Options :

1. ✔ Microstructural changes but does not melt

2. ✖ Neither melting nor microstructural changes

3. ✖ Melting as well as microstructural changes after solidification

4. ✖ Melting and retains the original microstructure after solidification

Question Number : 98 Question Id : 6364312978 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following welding process is used for joining of sheet metals made of all engineering metals (except copper, silver) in aircraft and automobile industries, and production of pipes and tubes

Options :

1. ✖ Thermit welding

2. ✖ Electroslag welding

3. ✔ Resistance welding

4. ✖ Submerged arc welding

Question Number : 99 Question Id : 6364312979 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The use of flux is essential in brazing in order to

Options :

1. ✖ Completely fill the gap between the workpieces

2. ✖ Enhance the capillary action to build the joint

3. ✔ Prevent oxidation and to remove oxide films from workpiece surfaces

4. ✖ Increase penetration of the filler material

Question Number : 100 Question Id : 6364312980 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Gas metal arc welding (GMAW) is used for joining

Options :

1. ✔ Thicker metals by employing consumable wire electrode

2. ✖ Thinner metals by employing consumable wire electrode

3. ✖ Thicker metals by employing non-consumable wire electrode

4. ✖ Thinner metals by employing non-consumable wire electrode

Question Number : 101 Question Id : 6364312981 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In order to improve the cutting action of the grinding wheel it is subjected to
_____ process

Options :

1. ✖ Truing

2. ✔ Dressing

3. ✖ Facing

4. ✖ Clearing

Question Number : 102 Question Id : 6364312982 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Why does the crater wear start at some distance from the tool tip

Options :

1. ✖ Tool strength is minimum in that region

2. ✖ Cutting fluid cannot penetrate that region

3. ✔ Tool temperature is maximum in that region

4. ✖ Stress on rake face is maximum in that region

Question Number : 103 Question Id : 6364312983 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Gray cast iron could be machined under dry condition because

Options :

1. ✖ Of its high ductility

2. ✖ Of its poor shear strength

3. ✖ It reacts with the cutting fluids

4. ✔ Graphite flakes act as solid lubricants

Question Number : 104 Question Id : 6364312984 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A hole of 8 mm diameter is to be created in a 24 mm thick MS plate on a drilling machine. If the drill bit is running at 360 rpm and a feed of 0.5 mm per revolution, the time required for the operation will be (in seconds)

Options :

1. ✔ 8

2. ✖ 4

3. ✖ 2

4. ✖ 32

Question Number : 105 Question Id : 6364312985 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In Electric discharge machining process the mechanism of material removal is

Options :

1. ✖ Cavitation and Evaporation

2. ✖ Melting and Corrosion

3. ✖ Erosion and Cavitation

4. ✔ Melting and Evaporation

Question Number : 106 Question Id : 6364312986 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Diamond locating pins are used in fixture due to

Options :

1. ✖ Exceptionally high wear resistance

2. ✔ Adjust any variation in centre distance between two holes

3. ✖ Ease of clamping the part on the diamond pins

4. ✖ Ease of manufacturing

Question Number : 107 Question Id : 6364312987 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Sensitivity of a measuring instrument is

Options :

1. ✖ A measure of how close the reading is to the actual size

2. ✖ The closeness with which a measurement can be read directly from the instrument

3. ✖ The capability to indicate the same reading again and again for a given measurand

4. ✔ The smallest change in measurand that can be measured

Question Number : 108 Question Id : 6364312988 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Optical micrometer is used to measure

Options :

1. ✖ Small angular displacements

2. ✖ Small linear displacements

3. ✔ Surface roughness

4. ✖ Surface profiles

Question Number : 109 Question Id : 6364312989 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following can't be used for angular measurements

Options :

1. ✔ Angle plate

2. ✖ Sine bar

3. ✖ Bevel protractor

4. ✖ Combination set

Question Number : 110 Question Id : 6364312990 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A shaft has dimension $\varnothing 30^{-0.009}_{-0.025}$. The values of fundamental deviation and tolerance are _____ respectively

Options :

1. ✖ -0.025, ±0.016

2. ✖ -0.025, 0.016

3. ✖ -0.009, ±0.016

4. ✔ -0.009, 0.016

Question Number : 111 Question Id : 6364312991 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The important feature of CAD/CAM in machining is its capability to

Options :

1. ✔ Describe the cutting tool path for various operations

2. ✖ Save the machining time

3. ✖ Increase material removal rate

4. ✖ Enhance the tool life

Question Number : 112 Question Id : 6364312992 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Feed drives in CNC milling machines consist of

Options :

1. ✖ Synchronous motors

2. ✖ Induction motors

3. ✖ Stepper motors

4. ✔ Servo-motors

Question Number : 113 Question Id : 6364312993 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The graph shown below depicts the qualitative relation between cutting speed and cost per piece produced. The curves A, B and C, respectively, represent
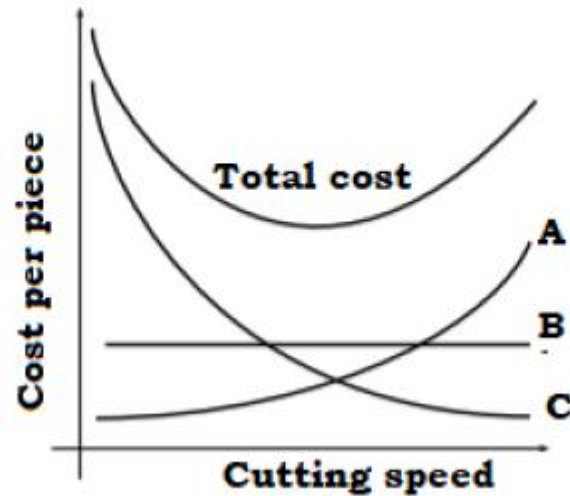
Options :

1. ✗   Machining cost, non-productive cost, tool changing cost

2. ✗   Non-productive cost, machining cost, tool changing cost

3. ✗   Tool changing cost, machining cost, non-productive cost

4. ✔   Tool changing cost, non-productive cost, machining cost

Question Number : 114 Question Id : 6364312994 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In order to forecast in a certain situation, exponential smoothing with a smoothing constant $\alpha = 0.4$ is to be used. If the forecast for n^{th} period is 500 and the actual demand for the corresponding period turned out to be 450, what will be the forecast for the $(n+1)^{th}$ period

Options :

1. ✗ 470

2. ✔ 480

3. ✗ 490

4. ✗ 500

Question Number : 115 Question Id : 6364312995 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Gantt chart provides information about the

Options :

1. ✗ Material handling layout

2. ✗ Proper utilization of manpower

3. ✔ Production schedule

4. ✖ Efficient working of machine

Question Number : 116 Question Id : 6364312996 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Market demand for certain gears is 4000 per annum. A company purchases these gears in lots and sells them. The cost of preparing the purchase order is Rs. 320 and the cost of storage of gears is Rs. 16 per stored piece per annum. The economic order quantity will be

Options :

1. ✖ 4000

2. ✖ $40\sqrt{10}$

3. ✖ $200\sqrt{8}$

4. ✔ 400

Question Number : 117 Question Id : 6364312997 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The ABC method of inventory control does not require the following information

Options :

1. ✖ Complete list of items

2. ✖ Unit cost of each item

3. ✖ Periodic consumption

4. ✔ Available stock for each item

Question Number : 118 Question Id : 6364312998 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In linear programming problem, if two constraints do not intersect in the positive quadrant. It can be concluded that

Options :

1. ✖ The solution is unbounded

2. ✔ The problem is infeasible

3. ✖ One of the constraint is redundant

4. ✖ The problem is feasible

Question Number : 119 Question Id : 6364312999 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is

Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

In a standard transportation problem with **m** sources of supply and **n** demand destinations, the solution is said to be degenerate if it has

Options :

1. ✔ Less than (m+n−1) allocations

2. ✖ Exactly (m+n−1) allocations

3. ✖ More than (m+n−1) allocations

4. ✖ m×n allocations

Question Number : 120 Question Id : 6364313000 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A PERT activity has an optimistic time estimate of 5 days, a pessimistic time estimate of 9 days, and a most likely time estimate of 10 days. The expected time of the activity will be

Options :

1. ✔ 9·0 days

2. ✖ 18.0 days

3. ✖   6·5 days

4. ✖   8.5 days