

Andhra Pradesh State Council of 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 29th May 2023 Shift 2
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No

Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

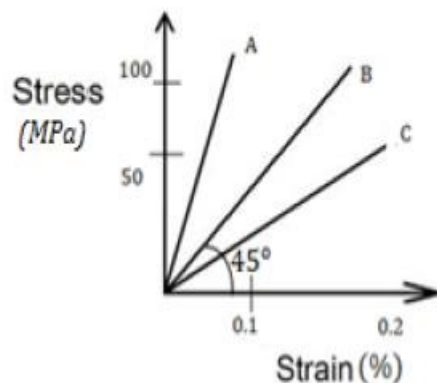
Mechanical Engineering

Section Id :	78773223
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 7877322641 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The graph shown below between stress and strain of three different materials A, B, C.

Which of these three is more stiffer?

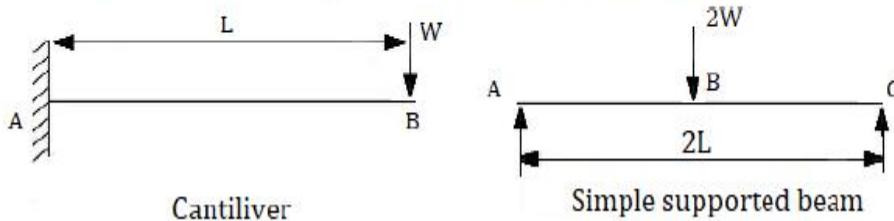


Options :

1. ✘ Both 'B' and 'C' are stiffer than 'A'
2. ✘ 'B' is more stiffer
3. ✘ 'C' is more stiffer
4. ✔ 'A' is more stiffer

Question Number : 2 Question Id : 7877322642 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following are the free-body diagrams for cantilever beam and simple supported beam. Identify the correct option pertaining to moment and deflection.



Options :

1. ✔ both moments and deflections are the same
2. ✘ moments of both cases are same
3. ✘ deflections for both cases are same

moments and deflections for both cases are different

4. ✘

Question Number : 3 Question Id : 7877322643 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the type of stress strain curve in order.

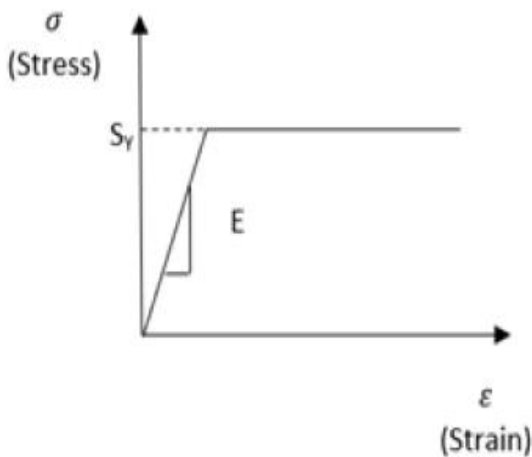


Fig (a)

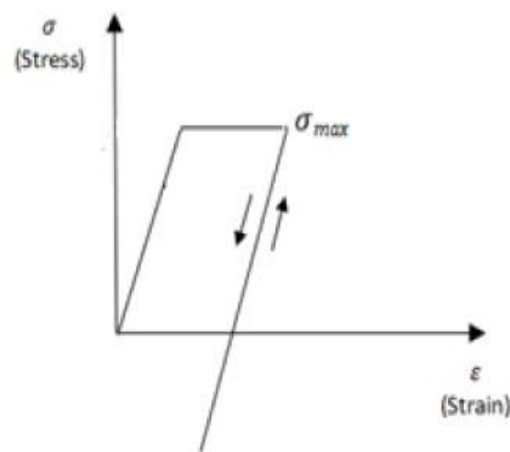


Fig (b)

Options :

Fig (a) – Elastic-Perfectly plastic material

1. ✘ Fig (b) – Pure elastic material

Fig (a) – Pure Plastic material

2. ✘ Fig (b) – No yielding

Fig (a) - Elastic-Perfectly plastic material

3. ✔ Fig (b) - Yielding on first cycle

4. ✘

Fig (a) – Pure elastic material

Fig (b) - Yielding on first cycle

Question Number : 4 Question Id : 7877322644 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

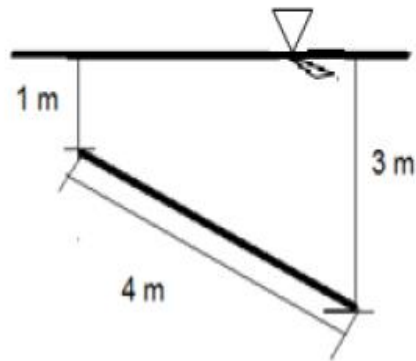
In which heat treatment process steel can achieve highest strength with extremely hard state

Options :

1. ✓ quenched steel
2. ✗ tempered steel
3. ✗ annealed steel
4. ✗ normalized steel

Question Number : 5 Question Id : 7877322645 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The greatest and the least depth of a circular plate of 4 m diameter from the free surface of water are 3 m and 1 m respectively as shown in the figure below. What will be the total pressure in (kN) on the plate?



Options :

1. ✘ 123

2. ✘ 185

3. ✔ 246

4. ✘ 308

Question Number : 6 Question Id : 7877322646 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a rolling process, if the velocity of roll surface (V_r) is 25 m/sec, 20 m/sec is the velocity of the material at the entrance (V_0) and 50 m/sec is the exit velocity of the roll (V_1) then the forward slip is _____.

Options :

1. ✘ 0.5 %

2. ✘ 0.2 %

3. ✘ 0.7 %

4. ✔ 1.0 %

Question Number : 7 Question Id : 7877322647 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a Brayton cycle band power plant, the air at the inlet is at 27°C 0.1 MPa. The pressure ratio is 6.25 and the maximum temperature is 800°C . Find the compressor work per kg of air. [Take $\gamma = 1.4$ and $C_p = 1.005 \text{ kJ/kgK}$]

Options :

1. ✔ 207.7 kJ/kg

2. ✘ 439.89 kJ/kg

3. ✘ 569.14 kJ/kg

4. ✘ 800 kJ/kg

Question Number : 8 Question Id : 7877322648 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A PERT network has 9 activities on its critical path. If the standard deviation of each activity on the critical path is 3, the standard deviation of the critical path is

Options :

1. ✘ 3

2. ✔ 9

3. ✘ 81

4. ✘ 27

Question Number : 9 Question Id : 7877322649 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Maximize $z = 4x + 6y$ subject to

$$3x + 2y \leq 12$$

$$x + y \geq 2$$

$$x, y \geq 0$$

Options :

1. ✘ 24 at (6,0)

2. ✔

36 at (0,6)

3. ✘ 24 at (0,4)

4. ✘ 16 at (4,0)

Question Number : 10 Question Id : 7877322650 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When two shafts are neither parallel nor intersecting, power can be transmitted by using

Options :

1. ✘ a pair of spur gears

2. ✘ a pair of helical gears

3. ✘ an Oldham's coupling

4. ✔ a pair of spiral gears

Question Number : 11 Question Id : 7877322651 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{\omega}{\omega_n} = \sqrt{2}$, where ω is the frequency of excitation and ω_n is natural frequency of

vibrations then the transmissibility of vibrations will be

Options :

1. ✘ 0.5

2. ✔ 1.0

3. ✘ 1.5

4. ✘ 2.0

Question Number : 12 Question Id : 7877322652 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The critical speed of a rotating shaft depends upon

Options :

1. ✘ mass

2. ✘ stiffness

3. ✔ mass and stiffness

4. ✘ mass, stiffness and eccentricity

Question Number : 13 Question Id : 7877322653 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In order to draw the acceleration diagram, it is necessary to determine the Coriolis component of acceleration in the case of

Options :

1. ✓ crank and slotted lever quick return mechanism
2. ✗ slider-crank mechanism
3. ✗ four bar mechanism
4. ✗ pantograph

Question Number : 14 Question Id : 7877322654 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total number of instantaneous centres for a mechanism consisting of 'n' links is

Options :

1. ✗ $\frac{n}{2}$
2. ✗ n

3. ✘ $\frac{n-1}{2}$

4. ✔ $\frac{n(n-1)}{2}$

Question Number : 15 Question Id : 7877322655 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a single slider four-bar linkage when the slider is fixed, it forms a mechanism of

Options :

1. ✔ hand pump

2. ✘ reciprocating engine

3. ✘ quick return

4. ✘ oscillating cylinder

Question Number : 16 Question Id : 7877322656 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equation of motion for a damped viscous vibration is $3\ddot{x} + 9\dot{x} + 27x = 0$

The damping factor is

Options :

1. ✘ 0.25

2. ✔ 0.50

3. ✘ 0.75

4. ✘ 1.00

Question Number : 17 Question Id : 7877322657 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the annular wheel of an epicyclic gear train has 100 teeth and the planet wheel has 20 teeth, the number of teeth on the sun wheel is

Options :

1. ✘ 80

2. ✔ 60

3. ✘ 40

4. ✘ 20

Question Number : 18 Question Id : 7877322658 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In case of free vibrations with viscous damping, the damping force is proportional to

Options :

1. ✘ the displacement
2. ✔ the velocity
3. ✘ the acceleration
4. ✘ the natural frequency

Question Number : 19 Question Id : 7877322659 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A rectangular section beam subjected to a bending moment M varying along its length is required to develop same maximum bending stress at any cross-section. If the depth of the section is constant, then its width will vary as

Options :

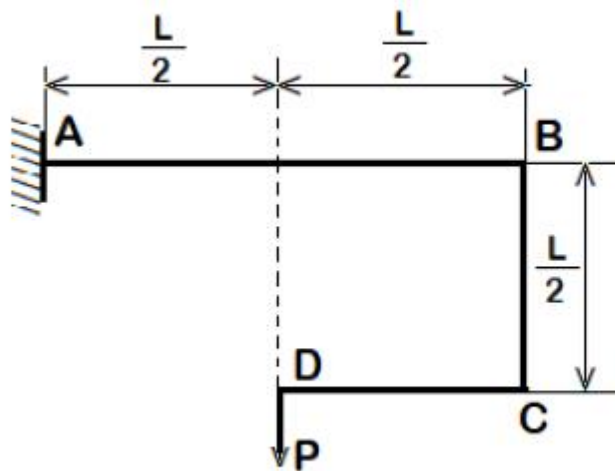
1. ✔ M
2. ✘ \sqrt{M}

3. ✘ M^2

4. ✘ $1/M$

Question Number : 20 Question Id : 7877322660 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A beam subjected to a load 'P' is shown in the figure below:



The bending moment at the support 'A' of the beam will be

Options :

1. ✘ PL

2. ✔ $PL/2$

3. ✘ $2 PL$

4. ✘ Zero

Question Number : 21 Question Id : 7877322661 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of independent elastic constants required to express the stress – strain relationship for a linearly elastic isotropic material is

Options :

1. ✘ one

2. ✔ two

3. ✘ three

4. ✘ four

Question Number : 22 Question Id : 7877322662 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A hollow shaft of the same cross – section area and material as that of a solid shaft, transmits

Options :

1. ✘ same torque

2. ✘ lesser torque

3. ✔ more torque

4. ✘ cannot be predicted

Question Number : 23 Question Id : 7877322663 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A double fillet welded joint with parallel fillet weld of length 'L' and leg 'B' is subjected to a tensile force 'P'. Assuming uniform shear stress distribution, the shear stress in the weld is given by

Options :

1. ✘ $\frac{\sqrt{2}P}{BL}$

2. ✘ $\frac{P}{2BL}$

3. ✔ $\frac{P}{\sqrt{2}BL}$

4. ✘ $\frac{2P}{BL}$

Question Number : 24 Question Id : 7877322664 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the assembly of shaft, pulley and key, the weakest number is

Options :

1. ✘ pulley

2. ✔ key

3. ✘ shaft

4. ✘ pulley and key

Question Number : 25 Question Id : 7877322665 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a multiple disc clutch, if there are 6 discs on the driving shaft and 5 discs on driven shaft, the number of pairs of contact surfaces will be equal to

Options :

1. ✘ 11

2. ✘ 12

3. ✓ 10

4. ✘ 22

Question Number : 26 Question Id : 7877322666 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rivet head used for boiler plate sinding is usually

Options :

1. ✓ snap head

2. ✘ pan head

3. ✘ counter sink head

4. ✘ conical head

Question Number : 27 Question Id : 7877322667 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the main advantage of hydrodynamic bearing over roller bearing?

Options :

1. ✘ Easy to assemble
2. ✘ Relatively low price
3. ✔ Superior load carrying capacity at higher speeds
4. ✘ Less frictional resistance

Question Number : 28 Question Id : 7877322668 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In low carbon sheets, presence of small quantities sulphur improves

Options :

1. ✘ weldability
2. ✘ formability
3. ✔ machinability
4. ✘ hardenability

Question Number : 29 Question Id : 7877322669 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Martensite is a supersaturated solution of carbon in

Options :

1. ✓ alpha iron
2. ✗ beta iron
3. ✗ gamma iron
4. ✗ delta iron

Question Number : 30 Question Id : 7877322670 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct sequence of elements of 18-4-1 HSS tool is

Options :

1. ✓ W, Cr, V
2. ✗ Mo, Cr, V
3. ✗ Cr, Ni, C
4. ✗ Cu, Zn, Sn

Question Number : 31 Question Id : 7877322671 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Single point thread cutting tool should ideally have

Options :

1. ✘ zero rake
2. ✔ positive rake
3. ✘ negative rake
4. ✘ normal rake

Question Number : 32 Question Id : 7877322672 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Directional solidification in casting can be improved by using

Options :

1. ✘ chills and chaplets
2. ✔ chills and padding
3. ✘ chaplets and padding

4. ✘ chills, chaplets and padding

Question Number : 33 Question Id : 7877322673 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following ingredients used in moulding.

(a) dry silica sand (b) clay (c) phenol formaldehyde (d) sodium silicate

Those used for shell moulding casting include

Options :

1. ✘ (a), (b), and (d)

2. ✘ (b), (c) and (d)

3. ✔ (a) and (c)

4. ✘ (a), (b), (c) and (d)

Question Number : 34 Question Id : 7877322674 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In orthogonal cutting, the depth of cut is 0.5 mm at a cutting speed of 2 m/s. If the chip thickness is 0.75 mm, the chip velocity is

Options :

1. ✓ 1.33 m/s

2. ✘ 2 m/s

3. ✘ 2/5 m/s

4. ✘ 3 m/s

Question Number : 35 Question Id : 7877322675 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most influential element on tool life is

Options :

1. ✓ nose radius

2. ✘ cutting speed

3. ✘ depth of cut

4. ✘ feed

Question Number : 36 Question Id : 7877322676 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cup of 10 cm height and 5 cm diameter is to be made from a sheet metal of 2mm thickness. The number of deductions necessary will be

Options :

1. ✘ one
2. ✘ two
3. ✔ three
4. ✘ four

Question Number : 37 Question Id : 7877322677 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following process does not cause tool wear.

Options :

1. ✘ USM
2. ✔ ECM
3. ✘ EDM

4. ✘ AMM

Question Number : 38 Question Id : 7877322678 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In metal cutting operation, the approximate ratio of heat distributed among chip, tool and work, in that order is

Options :

1. ✔ 80 : 10 : 10

2. ✘ 33 : 33 : 33

3. ✘ 20 : 60 : 10

4. ✘ 10 : 10 : 80

Question Number : 39 Question Id : 7877322679 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bending force required for V-bending, U-bending and Edge bending will be in the ratio of

Options :

1. ✔ 1 : 2 : 0.5

2. ✘ 2 : 1 : 0.5

3. ✘ 1 : 2 : 1

4. ✘ 1 : 1 : 1

Question Number : 40 Question Id : 7877322680 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following processes results in the best accuracy of the hole made?

Options :

1. ✘ drilling

2. ✔ reaming

3. ✘ broaching

4. ✘ boring

Question Number : 41 Question Id : 7877322681 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In solidification of metal during casting compensation for solid contraction is

Options :

1. ✓ provided by the oversize pattern
2. ✘ achieved by properly placed risers
3. ✘ obtained by promoting direction solidification
4. ✘ made by providing chills

Question Number : 42 Question Id : 7877322682 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Diamond pin location is used in a fixture because

Options :

1. ✘ It does not wear out
2. ✓ It takes care of any variation in centre distance between two holes
3. ✘ It is easy to clamp the part on diamond pins
4. ✘ It is easy to manufacture

Question Number : 43 Question Id : 7877322683 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a tool life test doubling the cutting speed reduces the tool life is $\frac{1}{8}$ of the original.

The Taylor's tool life index is

Options :

1. ✘ $\frac{1}{2}$

2. ✔ $\frac{1}{3}$

3. ✘ $\frac{1}{4}$

4. ✘ $\frac{1}{8}$

Question Number : 44 Question Id : 7877322684 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In rolling process, roll separating force can be decreased by

Options :

1. ✔ reducing the roll diameter

2. ✘ increasing the roll diameter

3. ✘ providing back-up rolls

4. ✘ increasing the friction between rolls and the metal

Question Number : 45 Question Id : 7877322685 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dry and compressed air is used as cutting fluid for machining

Options :

1. ✘ steel

2. ✘ aluminium

3. ✔ cast iron

4. ✘ brass

Question Number : 46 Question Id : 7877322686 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Scab is a

Options :

1. ✔ sand casting defect

2. ✘ machining defect

3. ✘ welding defect

4. ✘ forging defect

Question Number : 47 Question Id : 7877322687 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following sets of elements are quick – acting clamping elements for fixtures?

Options :

1. ✘ wedge and cam

2. ✔ cam and toggle

3. ✘ toggle and wedge

4. ✘ wedge, cam and toggle

Question Number : 48 Question Id : 7877322688 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is the correct expression for the Merchant's machinability constant? (where θ = shear angle, γ = friction angle, and α = rake angle)

Options :

1. ✓ $2\phi + \gamma - \alpha$

2. ✗ $2\phi - \gamma + \alpha$

3. ✗ $2\phi - \gamma - \alpha$

4. ✗ $\phi + \gamma + \alpha$

Question Number : 49 Question Id : 7877322689 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an interference fit?

Options :

1. ✗ push fit

2. ✗ running fit

3. ✗ sliding fit

4. ✓ shrink fit

Question Number : 50 Question Id : 7877322690 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The M and E – system in metrology are related to measurement of

Options :

1. ✘ screw threads

2. ✘ flatness

3. ✘ angularity

4. ✔ surface finish

Question Number : 51 Question Id : 7877322691 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to the principle of location in jigs and fixtures, how many degrees of freedom are to be eliminated to have a body fixed in space

Options :

1. ✘ 3

2. ✘ 4

3. ✔ 5

4. ✘ 6

Question Number : 52 Question Id : 7877322692 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is clearance fit ?

Options :

1. ✔ $\varnothing H50 \begin{matrix} +0.015 \\ +0.005 \end{matrix} \quad h 50 \begin{matrix} -0.010 \\ +0.000 \end{matrix}$

2. ✘ $\varnothing H50 \begin{matrix} +0.010 \\ +0.000 \end{matrix} \quad h 50 \begin{matrix} +0.025 \\ +0.015 \end{matrix}$

3. ✘ $\varnothing H50 \begin{matrix} -0.015 \\ +0.000 \end{matrix} \quad h 50 \begin{matrix} +0.025 \\ +0.005 \end{matrix}$

4. ✘ $\varnothing H50 \begin{matrix} -0.010 \\ -0.000 \end{matrix} \quad h 50 \begin{matrix} +0.030 \\ +0.005 \end{matrix}$

Question Number : 53 Question Id : 7877322693 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following methods is used for the manufacture of collapsible toothpaste tubes?

Options :

1. ✔ Impact extrusion

2. ✘ Direct extrusion

3. ✘ Deep drawing

4. ✘ Piercing

Question Number : 54 Question Id : 7877322694 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fit on a hole – shaft system is specified as H7 –S6. The type of fit is

Options :

1. ✘ Clearance fit

2. ✘ Running fit (sliding)

3. ✘ Transition fit

4. ✔ Interference fit

Question Number : 55 Question Id : 7877322695 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following methods can be used for forecasting the sales potential of a new product ?

Options :

1. ✘ Time series analysis
2. ✘ Jury of executive opinion method
3. ✘ Sales Force composite method
4. ✔ Direct survey method

Question Number : 56 Question Id : 7877322696 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Classifying items A, B and C categories for selective control in inventory management is done by arranging items in the decreasing order of

Options :

1. ✘ total inventory costs
2. ✘ item value
3. ✔ annual usage value
4. ✘ item demand

Question Number : 57 Question Id : 7877322697 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In inventory control theory, the Economic Order Quantity (EOQ) is

Options :

1. ✘ average level of inventory
2. ✔ optimum lot size
3. ✘ lot size corresponding to break – even analysis
4. ✘ capacity of warehouse

Question Number : 58 Question Id : 7877322698 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The routing function in a production system design is concerned with

Options :

1. ✘ Manpower utilization
2. ✘ Machine utilization
3. ✘ Quality assurance of the product

4. ✓ Optimizing material flow through the plan

Question Number : 59 Question Id : 7877322699 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following Linear programming problem:

$$\text{Max. } Z = 2A + 3B$$

$$\text{subject to } A + B \leq 10,$$

$$4A + 6B \leq 30,$$

$$2A + B \leq 17,$$

$$A, B \geq 0$$

What can one say about the solution

Options :

1. ✓ It may contain alternative optima
2. ✗ The solution will be unbounded
3. ✗ The solution will be degenerate
4. ✗ It cannot solve by simplex method

Question Number : 60 Question Id : 7877322700 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a $M/M/1 : \infty / FCFS$ Queue, the mean arrival rate is equal to 10 per hour and the mean service rate is 15 per hour. The expected queue length is

Options :

1. ✓ 1.33

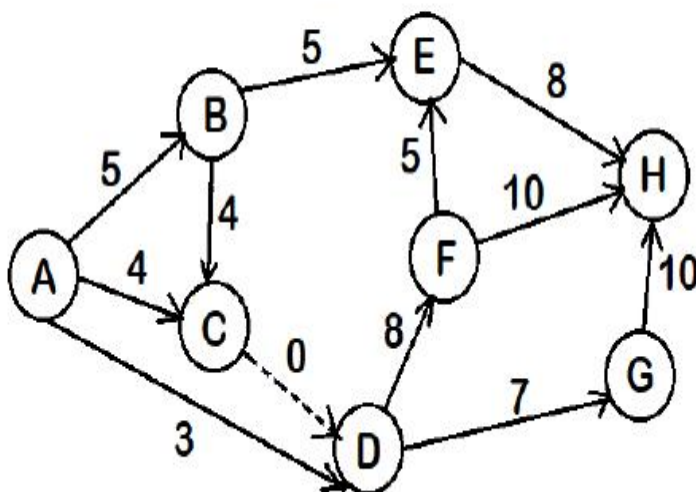
2. ✗ 1.53

3. ✗ 2.75

4. ✗ 3.20

Question Number : 61 Question Id : 7877322701 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the network shown in the given figure, the earliest expected completion time of the project is



Options :

1. ✗ 26 days

2. ✘ 27 days

3. ✔ 30 days

4. ✘ indeterminable

Question Number : 62 Question Id : 7877322702 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In PERT analysis critical activity has

Options :

1. ✘ maximum float

2. ✔ zero float

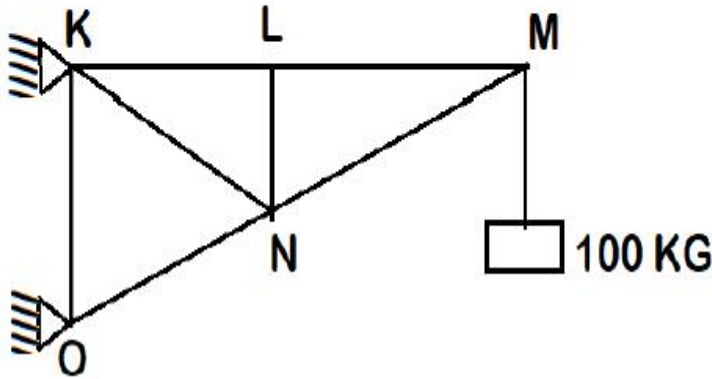
3. ✘ maximum cost

4. ✘ minimum cost

Question Number : 63 Question Id : 7877322703 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

A figure shows a pin – joined plane truss loaded at the point 'M' by hanging a mass of 100 kg. The member LN of the truss is subjected to a load of



Options :

1. ✓ zero
2. ✗ 490 N in compression
3. ✗ 981 N in compression
4. ✗ 981 N tension

Question Number : 64 Question Id : 7877322704 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A stream-line and an equipotential line in a flow field

Options :

1. ✗ are parallel to each other

2. ✓ are perpendicular to each other
3. ✗ intersect at an acute angle
4. ✗ are identical

Question Number : 65 Question Id : 7877322705 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider steady laminar incompressible anti-symmetric fully developed viscous flow through a straight circular pipe of constant cross – sectional area at a Reynolds number of 5. The ratio of inertia force to viscous force on a fluid particle is

Options :

1. ✓ 5
2. ✗ $1/5$
3. ✗ zero
4. ✗ infinite

Question Number : 66 Question Id : 7877322706 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

A fluid flow is represented by the velocity field $\vec{V} = ax\vec{i} + ay\vec{j}$, where 'a' is a constant. The equation of streamline passing through a point (1, 2) is

Options :

1. ✘ $x - 2y = 0$

2. ✘ $2x + y = 0$

3. ✔ $2x - y = 0$

4. ✘ $x + 2y = 0$

Question Number : 67 Question Id : 7877322707 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The SI unit of Kinematic Viscosity(ν) is

Options :

1. ✔ $\frac{m^2}{s}$

2. ✘ $\frac{kg}{m-s}$

3. ✘ $\frac{m}{s^2}$

$$\frac{m^3}{s^2}$$

4. ✘

Question Number : 68 Question Id : 7877322708 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As the temperature increases, the thermal conductivity of a gas

Options :

1. ✔ increases

2. ✘ decreases

3. ✘ remains constant

4. ✘ increases up to a certain temperature and then decreases

Question Number : 69 Question Id : 7877322709 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A reversed cannot cycle refrigerator maintains a temperature of $-5^{\circ}C$. The ambient air temperature is $35^{\circ}C$. The heat gained by the refrigerator at a continuous rate is 2.5 KJ/s.

The power (in Watt) required to pump this heat out continuously is

Options :

1. ✔

373.13 kW

2. ✘ 370.13 kW

3. ✘ 371.13 kW

4. ✘ 369.13 kW

Question Number : 70 Question Id : 7877322710 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum theoretical work obtainable, when a system interacts to equilibrium with a reference environment, is called

Options :

1. ✘ entropy

2. ✘ enthalphy

3. ✔ exergy

4. ✘ rothalphy

Question Number : 71 Question Id : 7877322711 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is a CFC refrigerant?

Options :

1. ✘ R744

2. ✘ R290

3. ✔ R502

4. ✘ R718

Question Number : 72 Question Id : 7877322712 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In order to have maximum power from a Pelton turbine, the bucket speed must be

Options :

1. ✘ equal to the jet speed

2. ✔ equal to half of the jet speed

3. ✘ equal to twice the jet speed

4. ✘ independent of the jet speed

Question Number : 73 Question Id : 7877322713 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A long thin walled cylindrical shell, closed at both ends, is subjected to an internal pressure. The ratio of the hoop stress to longitudinal stress developed in the shell is

Options :

1. ✘ 0.5

2. ✘ 1.0

3. ✔ 2.0

4. ✘ 4.0

Question Number : 74 Question Id : 7877322714 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an opaque surface, the absorptivity (α), transmission (τ) and reflectivity (ρ) are related by the equation

Options :

1. ✘ $\alpha + \rho = \tau$

2. ✘ $\rho + \alpha + \tau = 0$

3. ✔ $\alpha + \rho = 1$

4. ✘ $\alpha + \rho = 0$

Question Number : 75 Question Id : 7877322715 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following configurations has the highest fin effectiveness?

Options :

1. ✔ Thin, closely spaced fins

2. ✘ Thin, Widley spaced fins

3. ✘ Thick, Widley spaced fins

4. ✘ Thick, closely spaced fins

Question Number : 76 Question Id : 7877322716 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An ideal gas of mass 'm' and temperature T_1 undergoes a reversible isothermal process from an initial pressure P_1 to final pressure P_2 . The heat loss during the process is Q. The entropy changes ΔS of the gas is

Options :

1. ✘ $mR \ln \left(\frac{P_2}{P_1} \right)$

2. ✔ $mR \ln \left(\frac{P_1}{P_2} \right)$

3. ✘ $mR \ln \left(\frac{P_2}{P_1} \right) - \frac{Q}{T_1}$

4. ✘ Zero

Question Number : 77 Question Id : 7877322717 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Heat and work is

Options :

1. ✘ intensive properties

2. ✘ extensive properties

3. ✘ point functions

4. ✓ path functions

Question Number : 78 Question Id : 7877322718 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A turbo-charged four stroke injection diesel engine has a displacement volume of 0.0259 m^3 (25.9L). The engine has an output of 950 kW at 2200 rpm. The mean effective pressure in MPa is closest to

Options :

1. ✓ 2

2. ✘ 1

3. ✘ 0.2

4. ✘ 0.1

Question Number : 79 Question Id : 7877322719 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One kilogram of water at room temperature is brought into contact with a high temperature reservoir. The entropy change of the universe is

Options :

1. ✘ equal to entropy change of reservoir
2. ✘ equal to entropy change of water
3. ✘ equal to zero
4. ✔ always positive

Question Number : 80 Question Id : 7877322720 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a closed system is undergoing an irreversible process, the entropy of the system

Options :

1. ✔ must increase
2. ✘ always remains constant
3. ✘ must decrease
4. ✘ can increase, decrease or remain constant

Question Number : 81 Question Id : 7877322721 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a mass of moist air in an airtight vessel is heated to a higher temperature

Options :

1. ✘ specific humidity of the air increases
2. ✘ specific humidity of the air decreases
3. ✘ relative humidity of the air increases
4. ✔ relative humidity of the air decreases

Question Number : 82 Question Id : 7877322722 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dew point temperature is the temperature at which condensation begins when the air is cooled at constant

Options :

1. ✘ volume
2. ✘ entropy
3. ✔ pressure

enthalpy

4. ✘

Question Number : 83 Question Id : 7877322723 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the window air conditioner, the expansion device used is

Options :

1. ✔ capillary tube

2. ✘ thermostatic expansion valve

3. ✘ automatic expansion valve

4. ✘ float valve

Question Number : 84 Question Id : 7877322724 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A hydraulic turbine develops 1000 kW power for a head of 40 m. If the head is reduced to 20 m, the power developed in (kW) is

Options :

1. ✘ 177

2. ✘ 354

3. ✔ 500

4. ✘ 707

Question Number : 85 Question Id : 7877322725 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Rateau turbine belongs to the category of

Options :

1. ✔ pressure compound turbine

2. ✘ reaction turbine

3. ✘ velocity compound turbine

4. ✘ radial flow turbine

Question Number : 86 Question Id : 7877322726 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Green sand mould indicates that

Options :

1. ✘ polymeric mould has been cured

2. ✔ mould has been totally dried

3. ✘ hexagonal closed packed

4. ✘ body centred tetragonal

Question Number : 87 Question Id : 7877322727 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is a solid state joining process?

Options :

1. ✘ Gas tungsten arc welding

2. ✘ Resistance spot welding

3. ✔ Friction welding

4. ✘ Submerged arc welding

Question Number : 88 Question Id : 7877322728 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Disposable patterns are made of

Options :

1. ✘ wood
2. ✘ rubber
3. ✘ metal
4. ✔ polystyrene

Question Number : 89 Question Id : 7877322729 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

A built-up-edge is formed while machining

Options :

1. ✘ ductile materials at high speed
2. ✔ ductile materials at low speed
3. ✘ brittle materials at high speed
4. ✘

brittle materials at low speed

Question Number : 90 Question Id : 7877322730 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Maximum efficiency in reaction turbine is given by

Options :

1. ✓
$$\frac{2 \cos^2 \alpha}{1 + \cos^2 \alpha}$$

2. ✘
$$\frac{1 + \cos^2 \alpha}{2 \cos^2 \alpha}$$

3. ✘
$$\frac{1 + \cos \alpha}{2 \cos \alpha}$$

4. ✘
$$\frac{2 \cos \alpha}{1 + \cos \alpha}$$

Question Number : 91 Question Id : 7877322731 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tool signature are 10, 10, 8, 6, 8, 8, 3 then the side cutting edge angle and nose radius are

Options :

1. ✘ 6, 3

2. ✔ 8, 3

3. ✘ 8, 6

4. ✘ 10, 6

Question Number : 92 Question Id : 7877322732 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In laminar flow through a pipe, the Darch-Weisbach friction factor 'f' is given by

Options :

1. ✔ $\frac{64}{Re}$

2. ✘ $\frac{24}{Re}$

3. ✘ $\frac{16}{Re}$

4. ✘ $\frac{3}{16} Re$

Question Number : 93 Question Id : 7877322733 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Annual demand for a product is 25000 unit. The ordering cost per order is Rs.400 and inventory carrying cost (holding cost) is Rs.20 per unit per year. Find the EOQ.

Options :

1. ✘ 2000

2. ✔ 1000

3. ✘ 800

4. ✘ 1200

Question Number : 94 Question Id : 7877322734 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Normal rake and orthogonal rake of a turning tool will be same when its

Options :

1. ✘ $\phi = 0$

2. ✘ $\phi_1 = 0$

3. ✓ $\lambda = 0$

4. ✗ $\phi_1 = 90^\circ$

Question Number : 95 Question Id : 7877322735 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the number of links in a mechanism is 6, the number of pairs would be

Options :

1. ✓ 5

2. ✗ 2

3. ✗ 1

4. ✗ 4

Question Number : 96 Question Id : 7877322736 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Interchangeability is possible only in

Options :

1.

- 1. ✘ bevel gear
- 2. ✘ helical gear
- 3. ✔ spur gear
- 4. ✘ mitre gear

Question Number : 97 Question Id : 7877322737 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A circular shaft subjected to twisting moment results in maximum shear stress of 60 MPa.

Then the maximum compressive stress in the material is

Options :

- 1. ✘ 30 MPa
- 2. ✔ 60 MPa
- 3. ✘ 90 MPa
- 4. ✘ 120 MPa

Question Number : 98 Question Id : 7877322738 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam of span ' l ' is subjected to a uniformly varying load having zero intensity at the left support and ' w ' N/m at the right support. The reaction at the right support is

Options :

1. ✘ $\frac{wl}{2}$

2. ✘ $\frac{wl}{5}$

3. ✘ $\frac{wl}{4}$

4. ✔ $\frac{wl}{3}$

Question Number : 99 Question Id : 7877322739 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a gib and cotter joint, the gib and cotter are subjected to

Options :

1. ✘ single shear only

- 2. ✘ double shear only
- 3. ✘ single shear and crushing
- 4. ✔ double shear crushing

Question Number : 100 Question Id : 7877322740 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

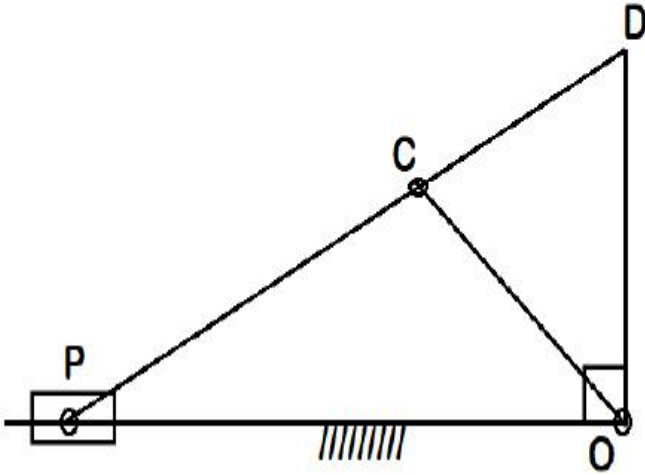
When a nut is tightened by placing a washer below it then the bolt will be subjected to

Options :

- 1. ✔ tensile stress
- 2. ✘ compressive stress
- 3. ✘ shear stress
- 4. ✘ both tensile and shear

Question Number : 101 Question Id : 7877322741 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Figure shows Klein's construction for slider – crank mechanism OCP drawn to full scale. What velocity does 'CD' represent ?



Options :

1. ✘ Velocity of the crank pin
2. ✘ Velocity of the piston
3. ✔ Velocity of the piston with respect to crank pin
4. ✘ Angular velocity to the connecting rod

Question Number : 102 Question Id : 7877322742 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a multi-rotor system of torsional vibrations, maximum number of nodes that can occur is

Options :

1. ✘ two
2. ✘ equal to the number of rotors plus one
3. ✘ equal to the number of rotors
4. ✔ equal to the number of rotors minus one

Question Number : 103 Question Id : 7877322743 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not a ceramic ?

Options :

1. ✘ Iron
2. ✔ Brass
3. ✘ Aluminium
4. ✘ Steel

Question Number : 104 Question Id : 7877322744 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Windows of aeroplane are made of

Options :

1. ✘ PVC
2. ✘ PTFE
3. ✔ PMMA
4. ✘ PEEK

Question Number : 105 Question Id : 7877322745 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an assembly line, what is the balance delay?

Options :

1. ✘ line efficiency x 100
2. ✔ 100 – line efficiency (in percentage)
3. ✘ $\frac{\text{Line efficiency}}{100}$
4. ✘ 100 – line efficiency

Question Number : 106 Question Id : 7877322746 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not a technique of Long-Range Forecasting?

Options :

1. ✘ Market Research and Market Survey
2. ✘ Delphi
3. ✘ Collective opinion
4. ✔ Correlation and Regression

Question Number : 107 Question Id : 7877322747 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In assignment problem for variable X_{ij}

(a) $X_{ij} = 1$ or 0 (b) $\sum_{j=1}^n X_{ij} = 1$ (c) $\sum_{i=1}^n X_{ij} = 1$ (d) $\sum_{i=1}^J X_{ij} = 0$

Which of these statements are correct

Options :

1. ✔ (a), (b) and (c)
2. ✘ (b) and (c) only

3. ✘ (a), (b), (c) and (d)

4. ✘ (a) and (b) only

Question Number : 108 Question Id : 7877322748 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A planar mechanism has 8 links and 10 rotary joints. The number of degrees of freedom of the mechanism is

Options :

1. ✘ Zero

2. ✔ One

3. ✘ Two

4. ✘ Three

Question Number : 109 Question Id : 7877322749 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a mass 1.3kg is attached to a spring and disturbed, the system is observed to exhibit oscillations of frequency 7.9 rad/s. What is the stiffness of the spring?

Options :

1.

✘ 38 N/m

2. ✘ 41 N/m

3. ✘ 76 N/m

4. ✔ 81 N/m

Question Number : 110 Question Id : 7877322750 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

'GO' and 'NO GO' gauge is a type of

Options :

1. ✘ Plug gauge

2. ✘ Slip gauge

3. ✘ Ring gauge

4. ✔ Limit gauge

Question Number : 111 Question Id : 7877322751 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following infinite series is convergent

Options :

1. ✘ $\sum_{n=1}^{\infty} \frac{1}{n}$

2. ✘ $\sum_{n=1}^{\infty} \left(\frac{4}{3}\right)^n$

3. ✔ $\sum_{n=1}^{\infty} (-1)^n \frac{n^3}{3^n}$

4. ✘ $\sum_{n=1}^{\infty} \frac{n^n}{n!}$

Question Number : 112 Question Id : 7877322752 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\iint_S F \cdot ds$, where $F(x, y, z) = xye^z \mathbf{i} + xy^2z^3 \mathbf{j} - ye^z \mathbf{k}$ and S is the surface of the box bounded by the coordinate planes and the planes $x = 3, y = 2,$ and $z = 1$ is

Options :

1. ✘ 16

2. ✘ $\frac{1}{2}$

3. ✔ $\frac{9}{2}$

4. ✘ $\frac{15}{2}$

Question Number : 113 Question Id : 7877322753 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f(x, y) = \begin{cases} \frac{x^3y-xy^3}{x^2+y^2} & \text{if } (x, y) \neq (0,0) \\ 0 & \text{if } (x, y) = (0,0) \end{cases}$. The value of $f_y(0,0)$ is

Options :

1. ✔ 0

2. ✘ -1

3. ✘ 1

4. ✘ Does not exists

Question Number : 114 Question Id : 7877322754 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solution of $\frac{dy}{dx} + 4y = 20, y(0) = 2$ at $x = 1$ is

Options :

1. ✘

$$\frac{5e^4-1}{e^4}$$

2. ✓ $\frac{5e^4-3}{e^4}$

3. ✗ $\frac{5e^4-5}{e^4}$

4. ✗ $\frac{e^4-1}{e^4}$

Question Number : 115 Question Id : 7877322755 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Inverse Laplace transform of $\frac{-s-10}{s^2-s-2}$ is

Options :

1. ✗ $3e^{-t} + 4e^{-2t}$

2. ✓ $3e^{-t} - 4e^{2t}$

3. ✗ $3e^{-t} + 1$

4. ✗ $-3e^{2t} + 4e^{-t}$

Question Number : 116 Question Id : 7877322756 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fair coin is tossed n times, if the probability that heads occurs 6 times is equal to the probability that heads occurs 8 times, then n is

Options :

1. ✘ 10

2. ✘ 12

3. ✘ 9

4. ✔ 14

Question Number : 117 Question Id : 7877322757 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X be a normal random variable with mean zero and variance 9. If $a = P(X \geq 3)$, then $P(|X| \leq 3)$ is

Options :

1. ✘ $2a$

2. ✔ $1 - 2a$

3. ✘ $2a + 1$

4. ✘ $2a - 2$

Question Number : 118 Question Id : 7877322758 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the system $2x - y + 3z = 2, x + y + 2z = 2, 5x - y + az = b$ has infinitely many solutions, then the values of a and b are respectively

Options :

1. ✘ -8 and 6

2. ✔ 8 and 6

3. ✘ -8 and -6

4. ✘ 8 and -6

Question Number : 119 Question Id : 7877322759 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eigenvectors of the matrix $\begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$ are written in the form $\begin{bmatrix} 1 \\ a \end{bmatrix}$ and $\begin{bmatrix} 1 \\ b \end{bmatrix}$. Then $a + b$ is

Options :

1. ✘ 0

2. ✔ $\frac{1}{2}$

3. ✘ 1

4. ✘ 2

Question Number : 120 Question Id : 7877322760 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider $\frac{dy}{dx} = 1 + \frac{y}{x}$, $1 \leq x \leq 2$, $y(1) = 2$. The approximate solution of y using the

Euler's method with $h = 0.25$ at $x = 1.5$ is

Options :

1. ✘ 3.625

2. ✘ 3.75

3. ✔ 3.55

4. ✘ 3.125