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NHPC JE | SSC JE

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BETA (β) FOR MECHANICAL ENGINEERS



MOST EXPECTED QUESTIONS

SET-5

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BY RK SIR

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निश्चित

करना ही होगा कि
लोग तुम्हारा
भाग्य अपनी सोच से
लिखे या तुम

अपना भाग्य

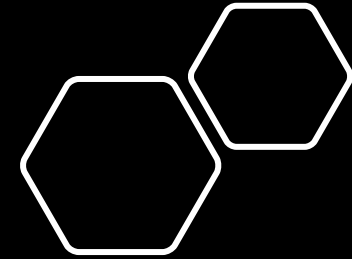
खद लिखोगे।



Which of the following is NOT a law of static friction?

NHPC -JE PYQ-6 April 2022

- (a) Limiting friction \times Normal reaction = Constant
- (b) The force of friction is independent of the area of contact between the two surfaces.
- (c) The magnitude of force of friction is exactly equal to the force, which tends to move the body.
- (d) The force of friction depends upon the roughness of the surfaces.





SEIKH ASHRAFUL ALAM 2 days ago

A . Limiting friction \times Normal reaction = Constant

Reply



Ravindra Kumar Nirala 5 hours ago

Option b absolutely right

Reply



Ankit Mongre 2 days ago

Option bb sir

Reply



krishna linda 2 days ago

Bbb

Reply



Vineet Thappa 2 days ago

BB

Reply



Pankaj Mahato 2 days ago

Bbbbbbn



MONA SINGH 2 days ago

B

1 Reply



alok3.0 kumar 2 days ago

Hw _BBBB

Reply

1 reply



UTPAL BAPARI 2 days ago

B

Reply

About Rk Sir

- 9 Year Teaching Experience
- GATE Ranker
- B.tech & MTech
- More 1 Lakh student Taught
- Highest selection ratio
- Known for concepts



hft



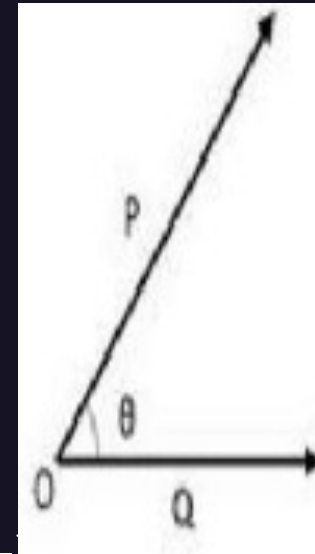
Two forces (magnitude P and Q) are acting at a point 'O' in a plane and inclined to each other at an angle of (as shown in figure). The magnitude of the resultant (R) of the forces is given by:

$$R = \sqrt{P^2 + Q^2 + 2PQ \cos \theta}$$

$$R = \sqrt{P^2 + Q^2 - PQ \cos \theta}$$

$$R = \sqrt{P^2 + Q^2 + PQ \cos \theta}$$

$$R = P + Q$$



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Calculate the specific weight of a liquid having a volume of 7 m^3 and weight of 42 kN .

- A. 6 kN/m^3
- B. $0.167 \text{ m}^3/\text{kN}$
- C. 252 kN-m^3
- D. $5.656 \text{ m}^3/\text{kN}$

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Ans (A)



Which of the following is correct for the vapour compression refrigeration cycle?

- A. The pressure at the inlet of the compressor is greater than the pressure at the outlet of the compressor.
- B. Specific enthalpy of the refrigerant increases during the throttling process.
- C. The pressure inside the condenser is less than the pressure inside the evaporator.
- D. The temperature inside the evaporator is less than the temperature inside the condenser.

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A rigid tank contains the steam at a pressure of 60 bar and has a specific enthalpy of 2470 kJ/kg. Which of the following is correct for this steam?

[Given: Specific enthalpy of saturated liquid water at 60 bar = 1210 kJ/kg, Specific enthalpy of vaporization of water at 60 bar = 1575 kJ/kg]

- A. Steam is wet with a dryness fraction of 0.8
- B. Steam is superheated
- C. Steam is wet with a dryness fraction of 0.2
- D. Steam is dry saturated

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Ans (A)



Dry saturated steam at a pressure of 11 bar enters a convergent-divergent nozzle and leaves at a pressure of 2 bar. The flow is adiabatic and frictionless and neglects the inlet velocity of steam. If the isentropic specific enthalpy drop between inlet and exit is 180 kJ/kg, what will be the exit velocity of steam?

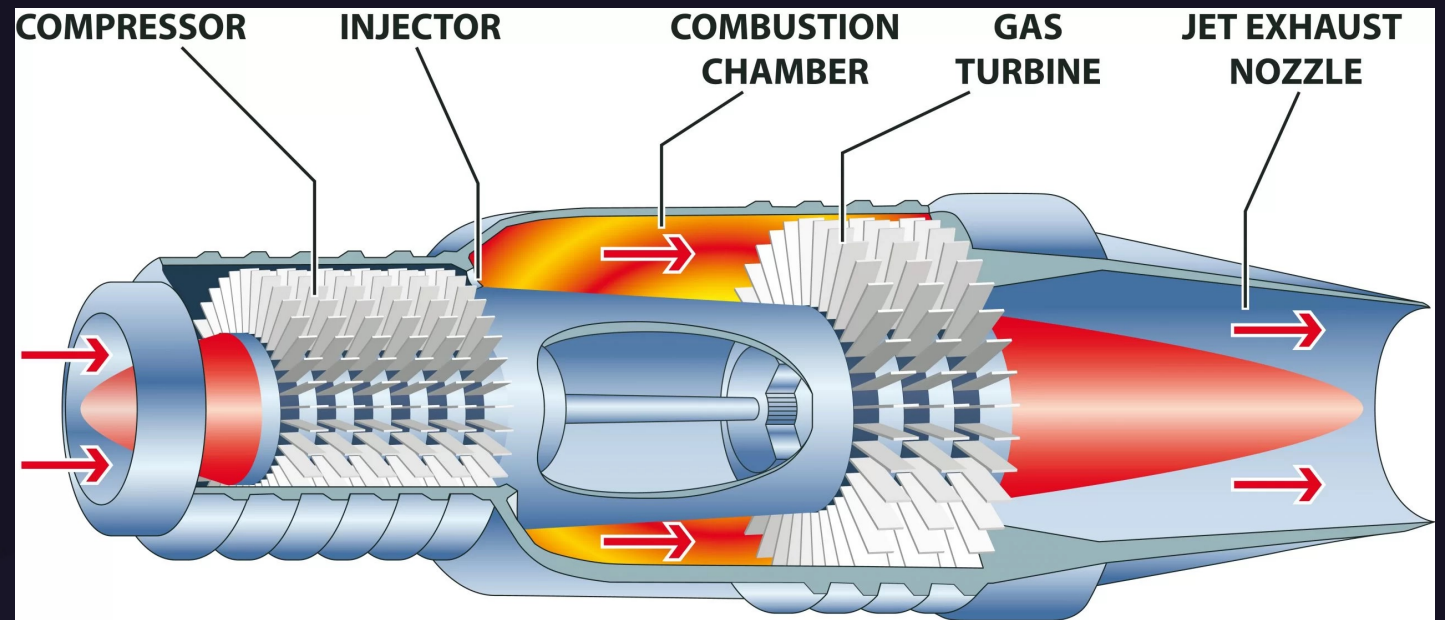
- A. 300 m/s
- B. 400 m/s
- C. 600 m/s
- D. 500 m/s

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Ans (C)

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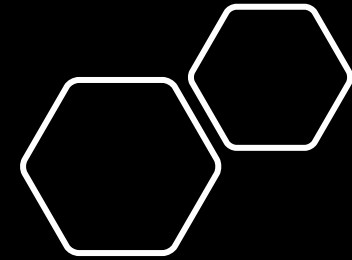
What is the value of Poisson's ratio of structural steel within its elastic range?

- A. 0.3
- B. 0.4
- C. 0.1
- D. 0.01

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Ans (A)

<i>S.No.</i>	<i>Material</i>	<i>Poisson 's ratio</i> <i>(1/m or μ)</i>
1	Steel	0.25 to 0.33
2	Cast iron	0.23 to 0.27
3	Copper	0.31 to 0.34
4	Brass	0.32 to 0.42
5	Aluminium	0.32 to 0.36
6	Concrete	0.08 to 0.18
7	Rubber	0.45 to 0.50





What will be the mass of 2 litres of liquid having the density of 8000 kg/m^3 ?

- A. 0.16 kg
- B. 1.6 kg
- C. 160 kg
- D. 16 kg

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Ans (D)



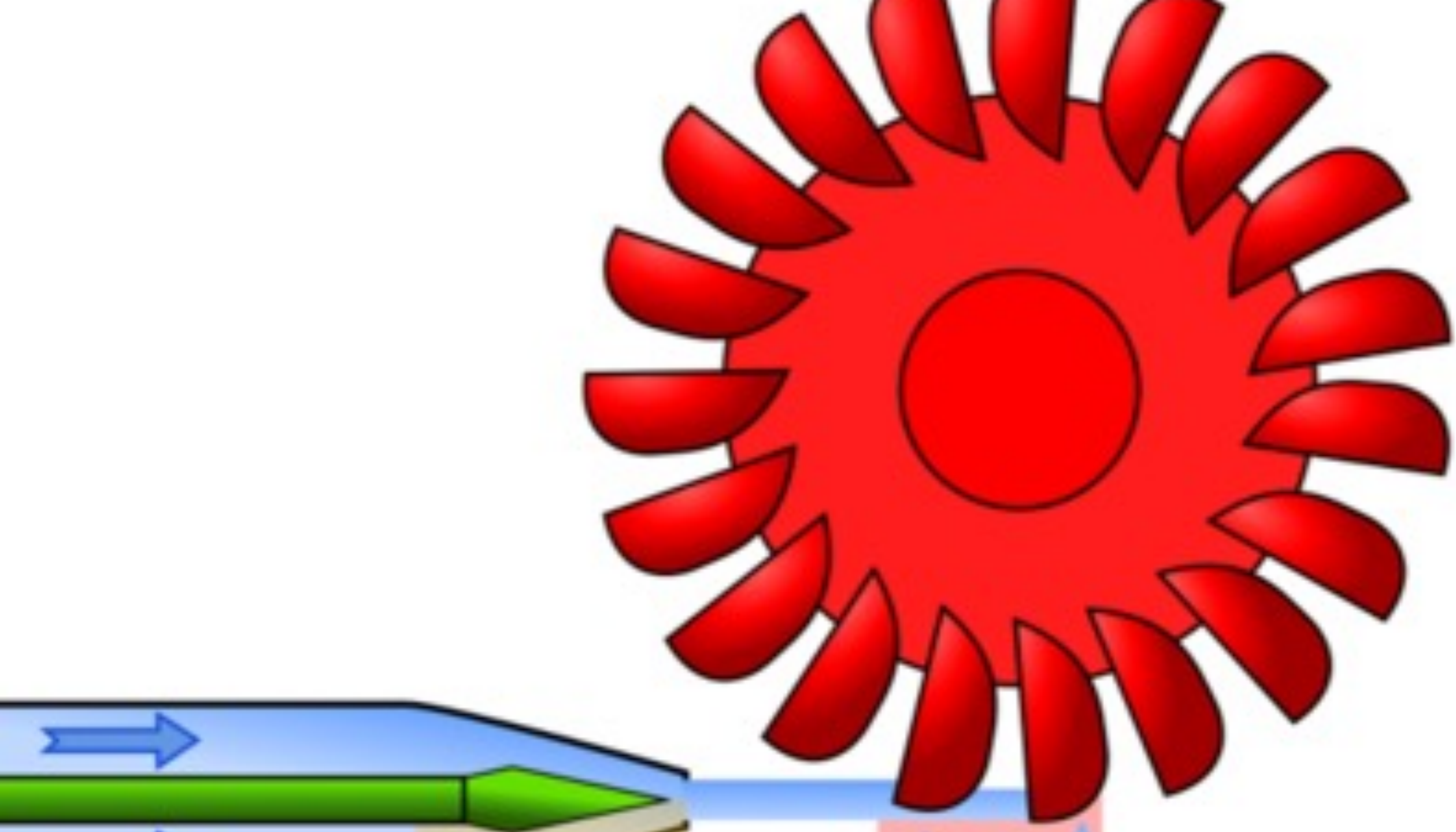
A Pelton wheel operates under a head of 40 m and develops shaft power of 800 kW which runs at 500 rpm. Assume the overall efficiency of the Pelton turbine as 80%.

Find the flow rate of water. [Density of water = 1000 kg/m³, Acceleration due to gravity = 10 m/s²]

- A. 2.0 m³/s
- B. 2.5 m³/s
- C. 1.5 m³/s
- D. 3.0 m³/s

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Ans (B)





Which of the following is NOT a type of rotary pump?

- A. Mixed flow pump**
- B. Impact pump**
- C. Centrifugal pump**
- D. Axial flow pump**

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Ans (B)



A beam engine works on a _____.

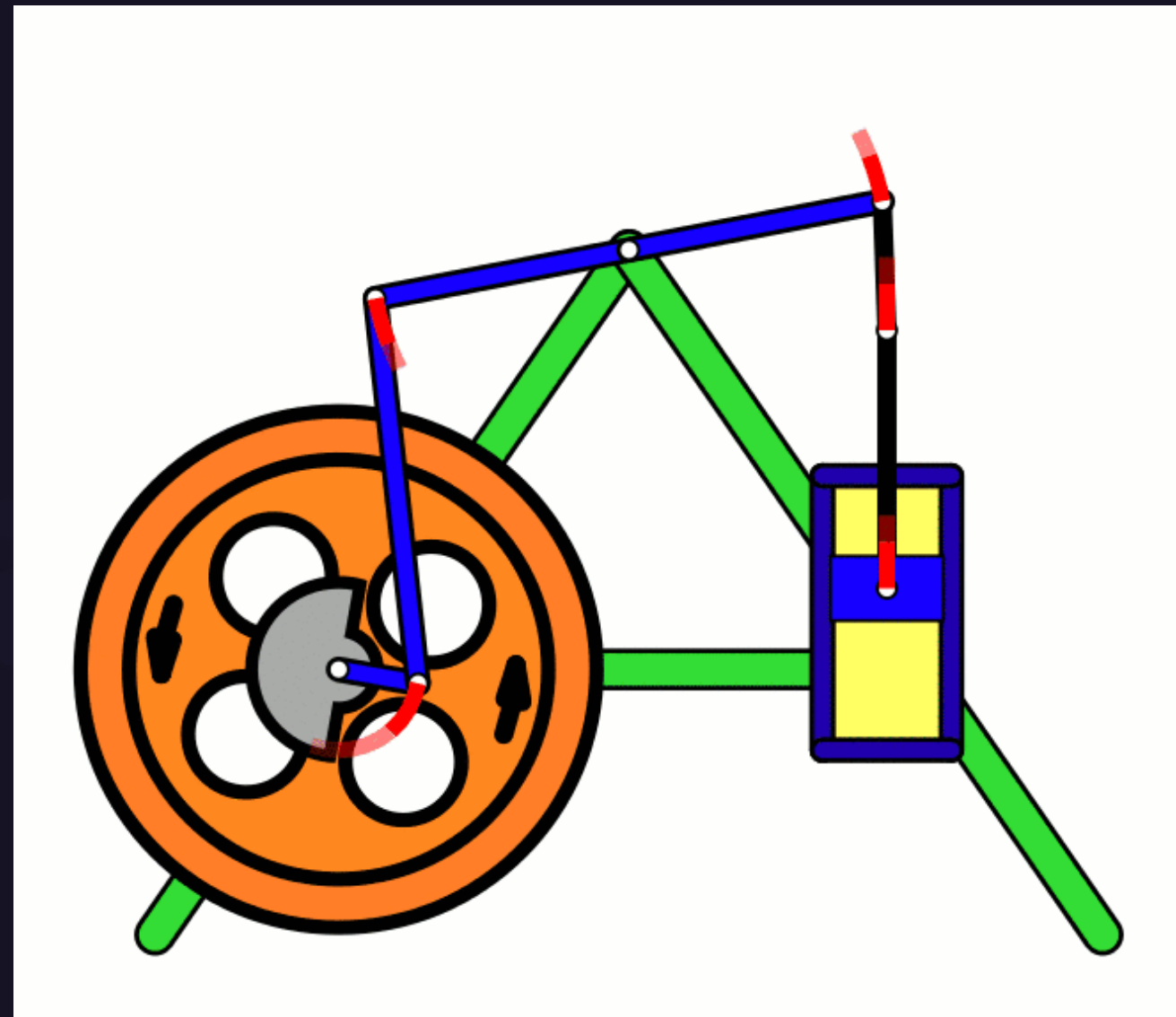
- A. crank and lever mechanism
- B. double crank mechanism
- C. single slider crank chain
- D. double lever mechanism

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Ans (A)

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The quantitative statement of entropy principle is denoted by the _____.

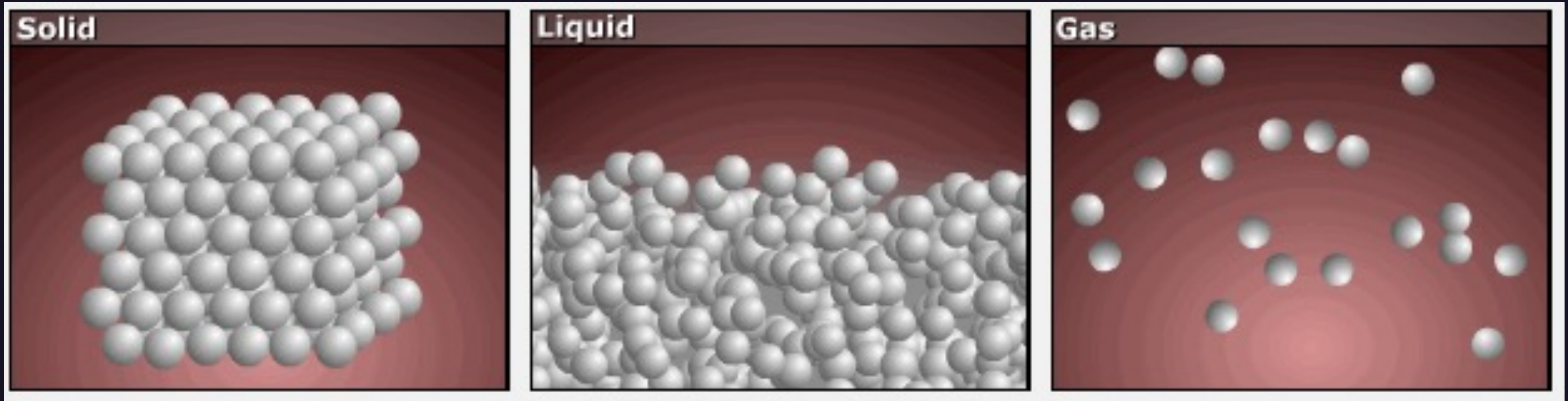
- A. zeroth law of thermodynamics
- B. 1st law of thermodynamics
- C. 3rd law of thermodynamics
- D. 2nd law of thermodynamics

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Ans (D)

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For irrotational flow, the Bernoulli constant is _____.

- A. different everywhere
- B. constant
- C. zero
- D. the same everywhere

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Ans (D)



Soldering fluxes perform which of the following tasks?

- A. Promote wetting of the faying surfaces**
- B. Decrease soldering time**
- C. Promote oxidation of the surface**
- D. Promote tarnishing of the surface**

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Ans (A)

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shift

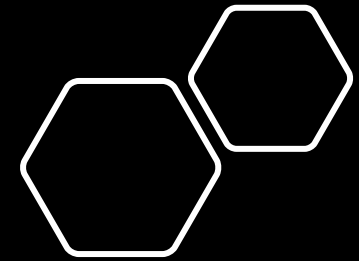
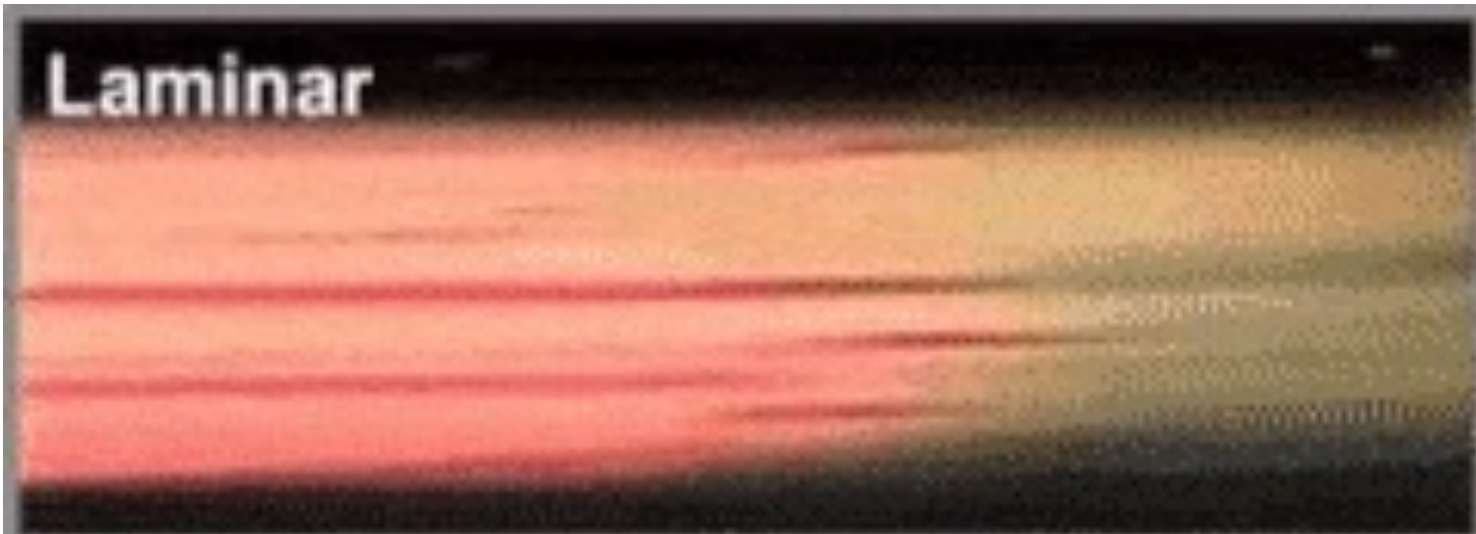


The flow is observed to be laminar till a Reynolds number value of about _____.

- A. 5000
- B. 2300
- C. 7000
- D. 1000

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Ans (B)



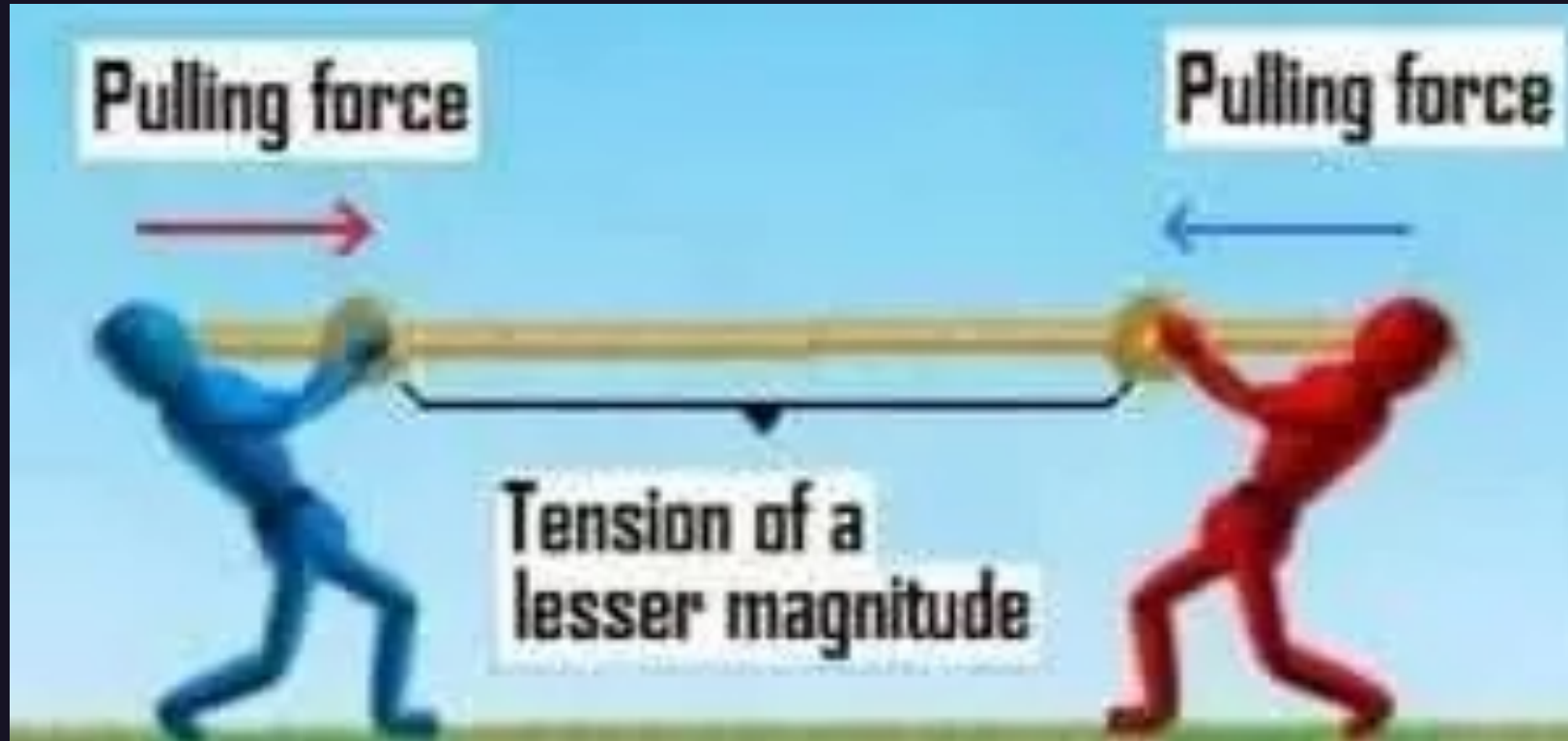


_____ forces are acting on a rope in a tug of war.

- A. Non-concurrent
- B. Parallel
- C. Non-collinear
- D. Collinear

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Ans (D)





A rod of length 150 cm and of diameter 2.0 cm is subjected to an axial pull of 20 kN. If the modulus of elasticity of the rod material is 2×10^5 N/mm², determine the stress developed in the rod.

- A. 15.25 N/mm²
- B. 30.65 N/mm²
- C. 63.662 N/mm²
- D. 10 N/mm²

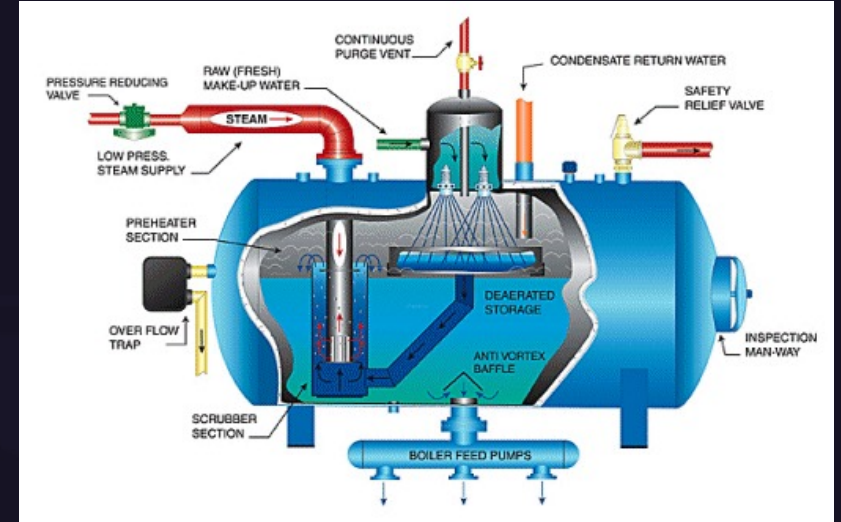
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Ans (C)



_____ is removed from a boiler by the blowdown valve.

- A. Ash
- B. Sludge
- C. Smoke
- D. Flue gas

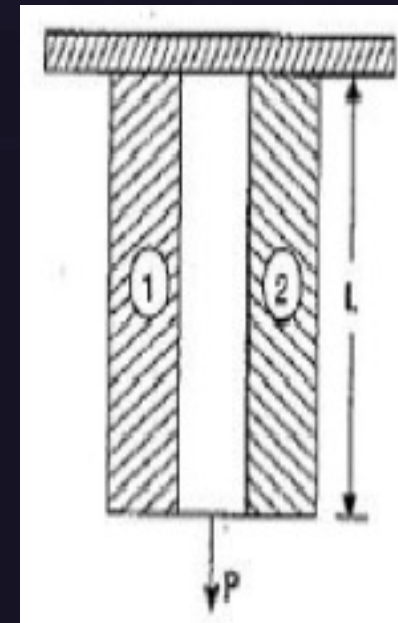


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During the analysis of bars of composite sections as shown in the given figure. The modular ratio is defined as _____.

- A. Young modulus of Bar 1 / Young modulus of Bar 2
- B. Shear modulus of Bar 2 / Shear modulus of Bar 1
- C. Shear modulus of Bar 1 / Shear modulus of Bar 2
- D. Young modulus of Bar 2 / Shear modulus of Bar 1



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Ans (A)



Ultrasonic testing is carried out to evaluate

_____.

- A. yield strength
- B. hardness
- C. toughness
- D. cracks in the surface

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Ans (D)



Inspection

Encoder

Area

Data

Start

Reset All

Start

Mode

Start

Off

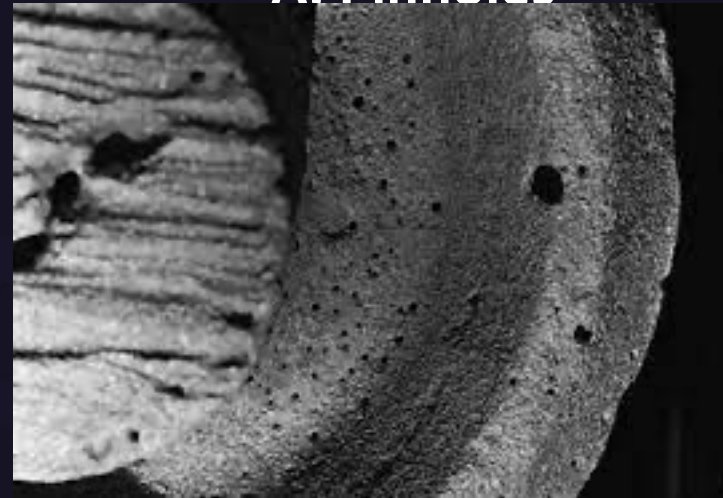
Pause

OLYMPUS



_____ is/are caused due to the release of gases during pouring which consists of small gas cavities.

A. Pinholes



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Ans (A)



The compression ratio of the diesel engine is in the range of _____.

- A. 16-20
- B. 25-40
- C. 6-10
- D. 1-5

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Ans (A)



Quality of the petrol used is expressed as _____.

- A. octane number
- B. petro number
- C. cetane number
- D. calorific value

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Ans (A)



The entropy of an isolated system _____.

- A. always remains constant
- B. can never be zero
- C. can never decrease
- D. can never increase

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Ans (C)



Governors are used in power plants to directly

_____.

- A. reduce carbon emissions
- B. decrease the power consumption
- C. control the flow of working fluids
- D. generate the working fluids



Ans (C)



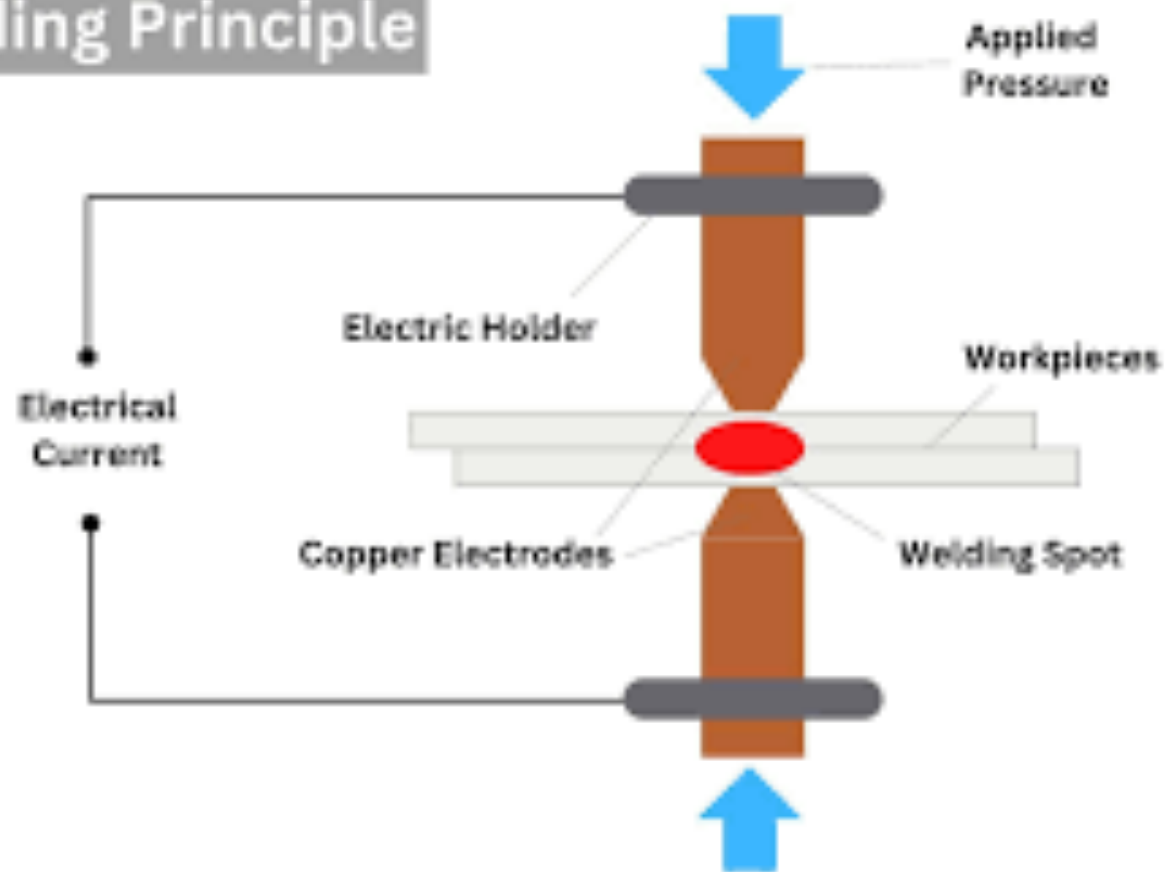
The weld area formed by the resistance spot welding process is called _____.

- A. finger
- B. toe
- C. leg
- D. nugget

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Ans (D)

Spot Welding Principle





Which of following statements is/are true for manometers?

- I) Manometers are easy to operate.
- II) Manometers do not require frequent calibration.
- III) Manometers are made of steel.

- A. Only II and III
- B. Only I and II
- C. Only I and III
- D. I, II and III

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Ans (B)



The coefficient of discharge for venturi meters is in the range of _____.

- A. 0.98 to 0.99
- B. 0.93 to 0.94
- C. 0.90 to 0.93
- D. 0.95 to 0.98



Cut-View of a Venturimeter



Typical Flanged Venturimeter



In which of the following water tube boilers are water tubes inclined at a certain angle?

- A. Babcock and Wilcox boiler**
- B. Locomotive boiler**
- C. Cornish boiler**
- D. Lancashire boiler**

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Ans (A)



Which of the following is NOT a loaded type of governor?

- A. Porter governor
- B. Proell governor
- C. Pickering governor
- D. Watt governor

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Ans (D)