1. The pressure at the summit of a syphon is
   1. less than atmosphere
   2. more than atmosphere
   3. equal to atmosphere
   4. none of these

   Ans:3

2. Which of the following quantity is a scalar quantity?
   1. Momentum
   2. Torque
   3. Energy
   4. Impulse

   Ans:3

3. A diode is a device which allows current
   1. to flow in both direction
   2. not to flow in any direction
   3. to flow in one direction
   4. none of these

   Ans:3

4. Core of a transformer is laminated to reduce
   1. Eddy current loss
   2. Heat loss
   3. Hysteresis loss
   4. All of these

   Ans:1

5. Core of a transformer is of silicon steel to reduce
   1. Eddy current loss
   2. Heat loss
   3. Hysteresis loss
   4. All of these

   Ans:4

6. The function of a gear box in an automobile is
   1. to provide variable speed
   2. to increase speed
   3. to reduce speed
   4. to produce torque

   Ans:1

7. Mercury when in a capillary tube has the following meniscus
   1. Convex
   2. Straight
   3. Concave
   4. None of the above

   Ans:1

8. The spherical shape of raindrops is due to
   1. atmospheric friction of air
   2. gravity of spherical earth
   3. surface tension
   4. viscosity of rainwater

   Ans:3

9. A commutator is provided in a DC generator
   1. to convert induced alternating voltage in unidirectional pulses
   2. to boost output voltage
   3. to prevent sparking
   4. none of the above

   Ans:1

10. In SI units, Young's Modulus is expressed in
    1. Pascal 2. Bar 3. Newton 4. None of the above

    Ans:1 (or N/m^2)

11. In a lead acid cell/battery, the electrolyte used is
    1. Sulphuric acid 2. Nitric acid
    3. Hydrochloric acid 4. None of the above

    Ans:1

12. A BYTE in computers means
    1. 16 bits 2. 8 bits 3. 4 bits 4. None of these

    Ans: 2

13. For axles and shafts the most suited hardening process is
    1. Case hardening 2. Carburising
    3. Annealing 4. Vulcanising

    Ans: 1

14. The unit of measurement of Kinetic Energy is
    1. Watt 2. Newton 3. Joule 4. None of these

    Ans: 3 (unit for all forms of energy is Joule)

15. Carburetors are used in
    1. CI engines 2. Hydraulic engines
    3. SI engines 4. None of the above

    Ans: 3

16. Insulating material for cables should have
    1. High dielectric strength 2. High resistivity
    3. Both (1) and (2) 4. None of the above

    Ans: 3

17. Which material is used to make rivets?

1. Cast Iron
2. Carbon Steel
3. Wrought Iron
4. Stainless Steel

Ans: 2

Materials used to make rivets

- STEEL

Low carbon steels are most often selected for rivet applications that primarily require good part formability so they can clinch over or upset well in your application.When higher carbon steels are specified for rivets and fasteners, the strength and hardness of the material increases and the formability of the material decreases. Higher carbon steel parts work-harden more when they are produced and work harden again as they are clinched or upset in your application. The steel raw material used to produce our rivets and fasteners have excellent formability. Screws and other cold formed special threaded fasteners typically are specified using higher carbon steels than the most common rivet materials. Long-lasting strength is a primary trait of carbon steel parts.

- STAINLESS STEEL

The corrosion resistance, mechanical properties and cold formability of stainless steel rivets, fasteners, and part designs are all important engineering considerations when selecting these fasteners. The chemical composition of each alloy determines the amount of the forming pressure that is required to produce the part. The chemical composition also determines the work hardening rate of the material during production and any additional cold working of the part (clinching) in order to fasten it into your assembly.

- ALUMINUM

Known for being soft and lightweight, aluminum continues to be one of the most common material choices for rivets and fasteners. Aluminum provides strong corrosion resistance and is ideal for many applications. Additionally, the formability of most aluminum material is excellent, so producing complex part configurations is often possible.

ALUMINUM ALLOY GRADES

Aluminum Material including 2024-T4, 2011-T3, 1000, 6061 as well as the 5000 and 6000 series aluminum alloys.

- COPPER

Due to its decorative appeal, copper is an ideal material for manufacturing functional items, and its conductivity makes it perfect for use in electrical applications. Copper

rivets are commonly used in clothes, saddles, shoes, belts, bags and more to reinforce the product and because of how aesthetically pleasing copper rivets look.

FASTENERS AND RIVETS GRADES OF COPPER

- CDA 102 (ASTM B-187)
- CDA 110 (ASTM B-187)

- BRASS

Brass rivets and fasteners are used in manufacturing due to their corrosion resistance, strength after cold-heading, conductivity, and aesthetic appeal. The cold forming process increases the strength of brass making it an ideal fastener for your requirements. Brass is an ideal material for use in electrical equipment due to in conductivity and for manufacturing functional items where decorative appeal is required. The corrosion resistance of brass lends itself to well to applications that are close to seawater.

GRADES OF BRASS FASTENERS & RIVETS

The Valley Fastener Group produces our fasteners and rivets, such as the solid brass rivet and brass shoulder fastener, from a variety of customer specified grades of brass including:

- CDA 260 (ASTM B-134)
- CDA 270 (ASTM B-134)

https://valleyfastener.com/materials/#:~:text=into%20your%20assembly.-,Aluminum,is%20ideal%20for%20many%20applications.

……

Aluminum. Known for being soft and lightweight, aluminum continues to be one of the most common material choices for rivets and fasteners. Aluminum provides strong corrosion resistance and is ideal for many applications.

18. Absolute pressure is
    1. Gauge pressure +2 Bars
    2. Gauge pressure -1 Bar
    3. Gauge pressure +1 Bar (atmospheric pressure)
    4. None of the above

Ans: 3 (Gauge pressure = absolute pressure ± atmospheric pressure. ***gauge pressure*** to be the pressure relative to atmospheric pressure. Gauge pressure is positive for pressures above atmospheric pressure, and negative for pressures below it.)

GAUGE PRESSURE

Gauge pressure is the pressure relative to atmospheric pressure. Gauge pressure is positive for pressures above atmospheric pressure, and negative for pressures below it.

The total pressure, or **absolute pressure**, is thus the sum of gauge pressure and atmospheric pressure:Pabs=Pg+PatmPabs=Pg+PatmwherePabsPabsis absolute pressure,PgPgis gauge pressure, andPatmPatmis atmospheric pressure. For example, if your tire gauge reads 34 psi (pounds per square inch), then the absolute pressure is 34 psi plus 14.7 psi (PatmPatmin psi), or 48.7 psi (equivalent to 336 kPa).

ABSOLUTE PRESSURE

Absolute pressure is the sum of gauge pressure and atmospheric pressure.

……

Atmospheric pressure. Everything around us – the air and water – has weight and creates pressure. At sea level, the average pressure is 1 atm, or around 14.7 psi (pounds per square inch). As elevation increases, the air gets thinner, and so does the atmospheric pressure. Atmospheric pressure also varies according to weather conditions.

Gauge pressure. The zero reference in gauge pressure is the atmospheric pressure, which means a gauge pressure reading shows just the additional pressure within a system. For this reason, gauge pressure is also called overpressure, as this is the pressure *over* atmospheric pressure.

Absolute pressure. The zero reference in absolute pressure is a perfect vacuum, which has no atmospheric pressure at all. Therefore, an absolute pressure reading displays the sum of the atmospheric pressure and the gauge pressure.

WHAT ARE THE ADVANTAGES OF MEASURING ABSOLUTE PRESSURE VS. GAUGE PRESSURE?

Since all the facilities in a refinery or manufacturing plant share the same elevation and atmospheric pressure, measuring gauge pressure is accurate enough for most processes. However, specialized situations call for absolute pressure, which are independent of fluctuations in atmospheric pressure. Absolute pressure gauges and transmitters are found in numerous applications, including altimeters for aviation, monitors for liquid vapor pressure, distillation processes, HVAC, and semiconductor manufacturing. The pressure of dangerous arsine and phosphine gases used in the semiconductor manufacturing process must be carefully monitored during storage and transport. Because atmospheric conditions fluctuate, it's important when monitoring dangerous gases to use a reference point that does not change.

https://blog.wika.us/products/pressure-products/frequently-asked-questions-pressure-importance-absolute-pressure/

…….

https://courses.lumenlearning.com/physics/chapter/11-6-gauge-pressure-absolute-pressure-and-pressure-measurement/

The total pressure, or ***absolute pressure***, is thus the sum of gauge pressure and atmospheric pressure: $\boldsymbol{P}_{abs} = \boldsymbol{P}_g + \boldsymbol{P}_{atm}$ where $\boldsymbol{P}_{abs}$ is absolute pressure, $\boldsymbol{P}_g$ is gauge pressure, and $\boldsymbol{P}_{atm}$ is atmospheric pressure. For example, if your tire gauge reads 34 psi (pounds per square inch), then the absolute pressure is 34 psi plus 14.7 psi ($\boldsymbol{P}_{atm}$ in psi), or 48.7 psi (equivalent to 336 kPa).

A *barometer* is a device that measures atmospheric pressure. A mercury barometer is shown below. This device measures atmospheric pressure, rather than gauge pressure, because there is a nearly pure vacuum above the mercury in the tube. The height of the mercury is such that $h\rho g = P_{atm}$. When atmospheric pressure varies, the mercury rises or falls, giving important clues to weather forecasters. The barometer can also be used as an altimeter, since average atmospheric pressure varies with altitude. Mercury barometers and manometers are so common that units of mm Hg are often quoted for atmospheric pressure and blood pressures. Table 1 gives conversion factors for some of the more commonly used units of pressure.

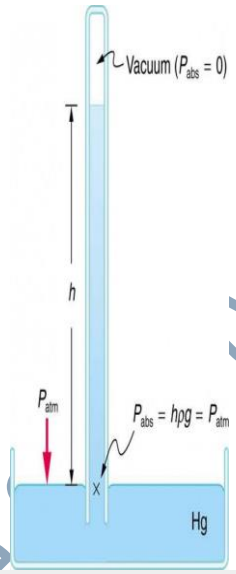


Figure. A mercury barometer measures atmospheric pressure. The pressure due to the mercury's weight, $h\rho g$, equals atmospheric pressure. The atmosphere is able to force mercury in the tube to a height h because the pressure above the mercury is zero.

Summary

- Gauge pressure is the pressure relative to atmospheric pressure.
- Absolute pressure is the sum of gauge pressure and atmospheric pressure.
- Aneroid gauge measures pressure using a bellows-and-spring arrangement

connected to the pointer of a calibrated scale.

- Open-tube manometers have U-shaped tubes and one end is always open. It is used to measure pressure.
- A mercury barometer is a device that measures atmospheric pressure.

Conversion to N/m^2 (Pa)	Conversion from atm
1.0 atm = 1.013×10^5 N/m^2	1.0 atm = 1.013×10^5 N
1.0 dyne/cm^2 = 0.10 N/m^2	1.0 atm = 1.013×10^6 d
1.0 kg/cm^2 = 9.8×10^4 N/m^2	1.0 atm = 1.013 kg/cm^2
1.0 lb/$in.^2$ = 6.90×10^3 N/m^2	1.0 atm = 14.7 lb/$in.^2$
1.0 mm Hg = 133 N/m^2	1.0 atm = 760 mm Hg
1.0 cm Hg = 1.33×10^3 N/m^2	1.0 atm = 76.0 cm Hg
1.0 cm water = 98.1 N/m^2	1.0 atm = 1.03×10^3 cm
1.0 bar = 1.000×10^5 N/m^2	1.0 atm = 1.013 bar
1.0 millibar = 1.000×10^2 N/m^2	1.0 atm = 1013 millibar

Table 1. Conversion Factors for Various Pressure Units

.....

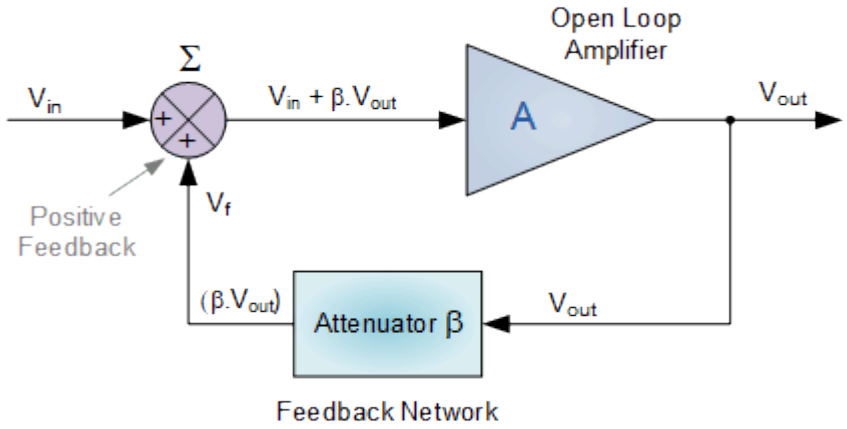
19. In an Oscillator circuit, the feedback is

1. positive
2. zero
3. negative
4. none of the above

Ans: 1

Oscillators are electronic circuits that generate a continuous periodic waveform at a precise frequency

Oscillators convert a DC input (the supply voltage) into an AC output (the waveform). This output waveform can have a wide range of different shapes and frequencies, and can be either complex in shape, or be a simple pure sine wave depending upon the application.



where β is a feedback fraction.

Oscillators are used in many pieces of test equipment producing either sinusoidal sine waves, square, sawtooth or triangular shaped waveforms or just a train of repetative pulses of a variable or constant width. **LC Oscillators** are commonly used in radio-frequency circuits because of their good phase noise characteristics and their ease of implementation.

An **Oscillator** is basically an Amplifier with "Positive Feedback", or regenerative feedback (in-phase) and one of the many problems in electronic circuit design is stopping amplifiers from oscillating while trying to get oscillators to oscillate.

Oscillators are self sustaining circuits generating an periodic output waveform at a single sinusoidal frequency. Thus for any electronic circuit to operate as an oscillator, it must contain the following three characteristics.

- Some form of Amplification
- Positive Feedback (regeneration)
- A Frequency determine feedback network

https://www.electronics-tutorials.ws/oscillator/oscillators.html#:~:text=Basic%20LC%20Oscillator%20Tank%20Circuit,form%20of%20an%20electromagnetic%20field.

……..

Positive or regenerate feedback:
• In positive feedback, the feedback energy (voltage or currents), is in phase with the input signal and thus aids it. Positive feedback increases gain of the amplifier also increases distortion, noise and instability.
• Because of these disadvantages, positive feedback is seldom employed in amplifiers. But the positive feedback is used in oscillators.

https://www.jntua.ac.in/gate-online-classes/registration/downloads/material/a159282103576.pdf

20. In an Amplifier circuit, the feedback is

1. positive
2. zero
3. negative
4. none of the above

Ans: 3

Amplifier is the generic term used to describe a circuit which produces and increased version of its input signal. However, not all amplifier circuits are the same as they are classified according to their circuit configurations and modes of operation.

In "Electronics", small signal amplifiers are commonly used devices as they have the ability to amplify a relatively small input signal, for example from a ***Sensor*** such as a photo-device, into a much larger output signal to drive a relay, lamp or loudspeaker for example.

There are many forms of electronic circuits classed as amplifiers, from Operational Amplifiers and Small Signal Amplifiers up to Large Signal and Power Amplifiers. The classification of an amplifier depends upon the size of the signal, large or small, its physical configuration and how it processes the input signal, that is the relationship between input signal and current flowing in the load.

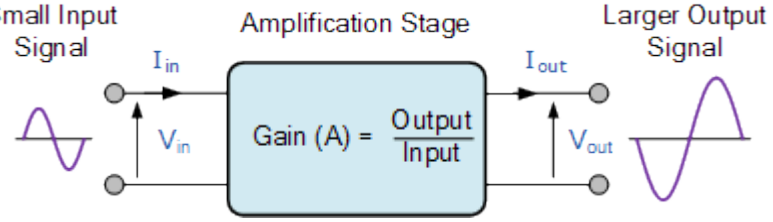
Amplifiers can be thought of as a simple box or block containing the amplifying device, such as a Bipolar Transistor, Field Effect Transistor or Operational Amplifier, which has two input terminals and two output terminals (ground being common) with the output signal being much greater than that of the input signal as it has been "Amplified".

An ideal signal amplifier will have three main properties: Input Resistance or (R_{IN}), Output Resistance or (R_{OUT}) and of course amplification known commonly as Gain or (A). No matter how complicated an amplifier circuit is, a general amplifier model can still be used to show the relationship of these three properties.

Amplifier Gain

The introduction to the amplifier gain can be said to be the relationship that exists between the signal measured at the output with the signal measured at the input. There are three different kinds of amplifier gain which can be measured and these are: ***Voltage Gain*** (Av), ***Current Gain*** (Ai) and ***Power Gain*** (Ap) depending upon the quantity being measured with examples of these different types of gains are given below.

Amplifier Gain of the Input Signal



Voltage Amplifier Gain

$$Voltage\ Gain\ (A_v) = \frac{Output\ Voltage}{Input\ Voltage} = \frac{Vout}{Vin}$$

CURRENT AMPLIFIER GAIN

$$Current\ Gain\ (A_i) = \frac{Output\ Current}{Input\ Current} = \frac{Iout}{Iin}$$

POWER AMPLIFIER GAIN

$$Power\ Gain\ (A_p) = A_v\ x\ A_i$$

https://www.electronics-tutorials.ws/amplifier/amp_1.html

/……..

Negative or Degenerate feedback:
• In negative feedback, the feedback energy (voltage or current), is out of phase with the input signal and thus opposes it.
• Negative feedback reduces gain of the amplifier. It also reduce distortion, noise and instability.
• This feedback increases bandwidth and improves input and output impedances.
• Due to these advantages, the negative feedback is frequently used in amplifiers.

https://www.jntua.ac.in/gate-online-classes/registration/downloads/material/a159282103576.pdf

21. A Vernier scale is 24 mm long and is divided into 25 equal parts. The main scale has small division of 1 mm. The least count of the Vernier Callipers is

1. 0.04 mm 2. 0.02 mm 3. 0.01mm 4. None of these

Ans: 2

22. The number 14 is written in Binary code as

1. 1111 2. 1010 3. 1110 4. None of these

Ans: 3

23. If the price of coal increases by 20% by what percentage must the consumption be reduced to keep the expenditure same?

1. 16.67% 2. 19.37% 3. 12.67% 4. None of these

Ans: 1

24. If C_p is the specific heat capacity at constant pressure, and C_v is the specific heat

capacity at constant volume, the universal gas constant R is denoted by the equation.

1. C_v/C_p 2. $C_v - C_p$ 3. C_p/C_v 4. $C_p - C_v$

Ans: 3

25. When strength is the major consideration which of the following process favored?

1. Forging 2. Sand casting 3. Rolling 4. None of these

Ans: 1

26. Cork is a good acoustic material since it

1. creates sound
2. reflects sound
3. absorbs sound
4. none of the above

Ans: 3

27. A Light year is a measure of

1. distance between astronomical bodies
2. brightness
3. time
4. none of the above

Ans: 1

Light-year is the distance light travels in one year, A light-year is a measurement of distance and not time (as the name might suggest).

ALTERNATIVES TO LIGHT-YEARS

Astronomers also use parsecs as an alternative to the light-year. Short for parallax-second, a parsec comes from the use of triangulation to determine the distance of stars. To be more specific, it is the distance to a star whose apparent position shifts by 1 arcsecond (1/3,600 of a degree) in the sky after Earth orbits halfway around the sun. One arcsecond is equal to 3.26 light-years.

https://www.space.com/light-year.html

28. The threads of a Screw jack are

1. Square thread
2. Whitworth thread
3. Butterss thread
4. None of the above

Ans: 1

29. The hardest substance known to mankind is

1. Platinum
2. Diamond
3. Talc
4. Plutonium

Ans: 2

30. The type of motors used for traction applications in Locomotives are
1. DC Shunt Motors
2. Compound Motors
3. DC Series Motors
4. None of the above

Ans: 3

31. The upthrust(force) experienced by a body in a fluid depends upon
1. mass of the body
2. weight of the ;body
3. weight of fluid displaced by it
4. none of the above

Ans: 3

32. A pressure of 8.5 kgs/cm^2 will be experienced by a body immersed in an oil of specific gravity 0.85 at a depth of
1. 80 cm
2. 80 meter
3. 800 meter
4. 8 meter

Ans: 3

33. For fluid flow, the velocity of a fluid particle at the center of a pipeline is
1. minimum
2. zero
3. maximum
4. none of the above

Ans: 3

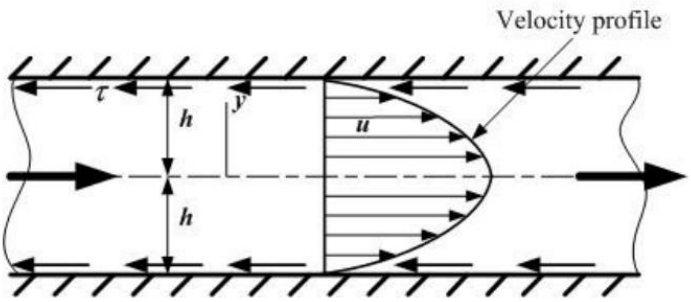


Fig.1 Typical flow through pipe

http://www.tezu.ernet.in/dmech/people/smkmech_files/smk/ME202/lec1.pdf

34. For fluid flow, the velocity of a fluid particle at the surface of a pipeline is
1.minimum 2. zero
3.maximum 4. none of the above

Ans: 2

35. A stone when dropped from a height of 30 meter takes T seconds to reach the ground. If it is released from 120 meter, it will reach the ground after
1. 1.5T s 2. 2T s 3. same T s 4. none of these

Ans: 2

For freely falling bodies, distance travelled while hitting the ground, $S = H = \frac{1}{2}gT^2$

$\frac{S_1}{S_2} = \frac{{T_1}^2}{{T_2}^2} = ¼$

36. The safe working load for a crane of 125 T capacity with a factor of safety of 1.25 is

1. 150 T 2. 100 T 3. 137.5 T 4. 172.5 T

Ans:2 (Safe working load = Capacity/factor of safety)

37. A radiation pyrometer is used for temperatures
1. 100-250°C 2. 250-500°C
3. upto 100°C 4. above 500°C

Ans: 4

Total radiation pyrometers are used to measure temperature in the **range 700°C to 2000°C**.
Radiation pyrometers focus the infrared radiation emitted by the body onto a thermocouple contained within the instrument. The voltage produced by the thermocouple is then read on a dial calibrated directly in terms of temperature.
https://www.sciencedirect.com/topics/engineering/radiation-pyrometer

38. If the angle of incidence of light 90° and after refraction, the angle is 30°, the refractive index of the medium is
1. 1.5 2. 2 3. 0.5 4. 1.25

Ans: 2 (the refractive index of the medium, n or μ = sin i /sin r)

39. The planet closest to the Sun is
1. Mercury 2. Pluto 3. Mars 4. None of these

Ans: 1

40. The Wright brothers invented
    1. Telescope 2. Aeroplane 3. Radio 4. Helicopter

    Ans: 2

41. A sphere, a cube and a circular plate are heated to 200°C and left to Cool, which of them will cool fastest?
    1. Cube 2. Circular plate
    3. Sphere 4. None of the above

    Ans: 2 (heat transfer rate: Q $\propto$ A where A is surface area)

42. When the length of a pendulum clock is quadrupled its time period is
    1. halved 2. doubled
    3. the same 4. tripled

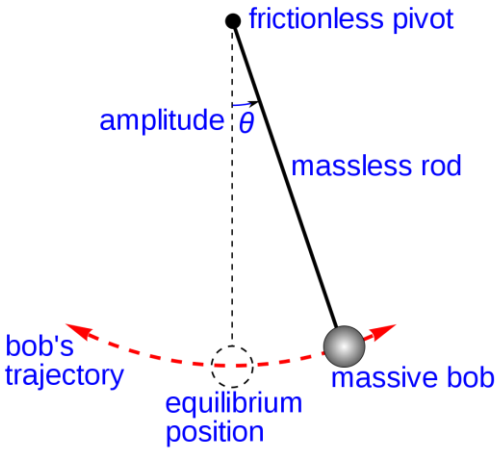
    Ans: 2(increase or be increased fourfold.)

    Note: $T = 2\pi\sqrt{\frac{l}{g}}$, if $l \rightarrow 4l$, $T \rightarrow 2T$

    A **pendulum** is a weight suspended from a pivot so that it can swing freely. When a pendulum is displaced sideways from its resting, equilibrium position, it is subject to a restoring force due to gravity that will accelerate it back toward the equilibrium position. When released, the restoring force acting on the pendulum's mass causes it to oscillate about the equilibrium position, swinging back and forth. The time for one complete cycle, a left swing and a right swing, is called the period. The period depends on the length of the pendulum and also to a slight degree on the amplitude, the width of the pendulum's swing.

    The *simple gravity pendulum* is an idealized mathematical model of a pendulum. This is a weight (or bob) on the end of a massless cord suspended from a pivot, without friction. When given an initial push, it will swing back and forth at a constant amplitude. Real pendulums are subject to friction and air drag, so the amplitude of their swings declines.

    https://en.wikipedia.org/wiki/Pendulum#:~:text=Pendulum%20clocks%20should%20be%20attached,%2C%20or%20shorter%2C%20are%20used.



By Chetvorno - Own work, Public Domain, https://commons.wikimedia.org/w/index.php?curid=5276335

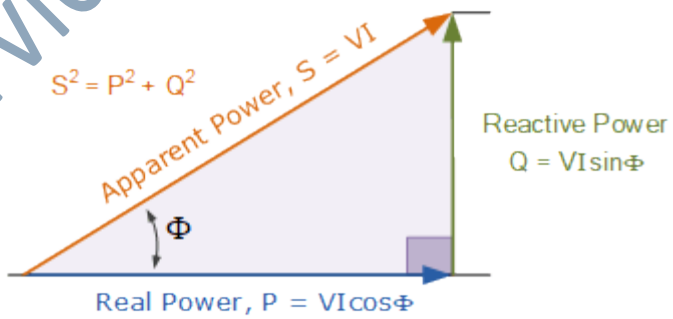
https://en.wikipedia.org/wiki/Pendulum#/media/File:Simple_gravity_pendulum.svg

43. The power factor of a circuit can be improved by including in the circuit
    1. a capacitor
    2. an inductor
    3. a resistor
    4. none of the above

Ans: 1

The power factor of an AC circuit is defined as the ratio of the real power (W) consumed by a circuit to the apparent power (VA) consumed by the same circuit. This therefore gives us: **Power Factor = Real Power/Apparent Power**, or p.f. = W/VA

POWER TRIANGLE OF AN AC CIRCUIT



Where

P is the I^2*R or Real power that performs work measured in watts, W

Q is the I^2*X or Reactive power measured in volt-amperes reactive, VAr

- **S** is the I^2*Z or Apparent power measured in volt-amperes, VA

- **Φ** is the phase angle in degrees.

POWER FACTOR OF AN AC CIRCUIT

$$\text{Power Factor} = \frac{\text{watts}}{\text{volt-amperes}}$$

$$= \frac{P}{S} = \frac{VI\cos\phi}{VI} = \cos\phi$$

https://www.electronics-tutorials.ws/accircuits/power-triangle.html#:~:text=The%20power%20factor%20of%20an,or%20p.f.%20%3D%20W%2FVA.

44. Water has maximum density at
    1. 100°C 2. 0°C 3. 4°C 4. -273°C

    Ans: 3

45. To dilute an acid, we must
    1. Add water into acid
    2. mix equal quantities of acid and water
    3. Add acid into water
    4. none of the above

    Ans: 3 (from safety point of view)

    If water is added to acid, heat is released that the solution may boil very violently, splashing concentrated acid out of the container and all this because the reaction is exothermic. ... So **it is always safer to add acid to water, and not water to acid**

46. Sodium is stored by keeping under
    1. kerosene 2. vegetable oil
    3. water 4. none of the above

    Ans: 1

47. Mohs scale is used to measure
    1. Hardness of materials/objects of industrial importance
    2. basicity
    3. acidity
    4. none of the above

    Ans: 1 (1-10)

The **Mohs scale of mineral hardness** is a qualitative ordinal scale, from 1 to 10, characterizing scratch resistance of various minerals through the ability of harder material to scratch softer material.

WHAT IS MOHS HARDNESS SCALE?

One of the most important tests for identifying mineral specimens is the **Mohs Hardness Test**. This test compares the resistance of a **mineral** to being scratched by ten reference minerals known as the Mohs Hardness Scale (see table at left). The test is useful because most specimens of a given mineral are very close to the same hardness. This makes hardness a reliable diagnostic property for most minerals.

Mohs Hardness Scale

Mineral	Hardness
Talc	1
Gypsum	2
Calcite	3
Fluorite	4
Apatite	5
Orthoclase	6
Quartz	7
Topaz	8
Corundum	9
Diamond	10

https://geology.com/minerals/mohs-hardness-scale.shtml

48. A sample of water is called heavy water because
    1. it reacts with acids

2. it does not lather with soap
3. is heavier than potable water
4. none of the above

Ans: 2 (Ordinary water H_2O and heavy water D_2O)

Heavy water is 10.6% denser than ordinary water, and ***heavy water's*** physically different properties.
Molar mass: 20.0276 g/mol
Boiling point: 101.4 °C
Density: 1.11 g/cm³
https://www.google.com/search?q=heavy+water

HEAVY WATER (D2O)

Water containing significantly more than the natural proportions (one in 6,500) of heavy hydrogen (deuterium, D) atoms to ordinary hydrogen atoms. Heavy water is used as a moderator in some reactors because it slows down neutrons effectively and also has a low probability of absorption of neutrons.

https://www.nrc.gov/reading-rm/basic-ref/glossary/heavy-water-d2o.html
…….
Heavy water (**deuterium oxide**) is a form of water that contains only deuterium (^{2}H or D, also known as *heavy hydrogen*) rather than the common hydrogen-1 isotope (^{1}H or H, also called *protium*) that makes up most of the hydrogen in normal water.The presence of the heavier hydrogen isotope gives the water different nuclear properties, and the increase of mass gives it slightly different physical and chemical properties when compared to normal water.
https://en.wikipedia.org/wiki/Heavy_water
……

Heavy water (D_2O), also called **deuterium oxide**, water composed of deuterium, the hydrogen isotope with a mass double that of ordinary hydrogen, and oxygen. (Ordinary water has a composition represented by H_2O.) Thus, heavy water has a molecular weight of about 20 (the sum of twice the atomic weight of deuterium, which is 2, plus the atomic weight of oxygen, which is 16), whereas ordinary water has a molecular weight of about 18 (twice the atomic weight of ordinary hydrogen, which is 1, plus oxygen, which is 16).

Ordinary water as obtained from most natural sources contains about one deuterium atom for every 6,760 ordinary hydrogen atoms. and the residual water is thus enriched in deuterium content. Continued electrolysis of hundreds of litres of water until only a few millilitres remain yields practically pure deuterium oxide. This operation, until 1943 the only large-scale method used, has been superseded by less expensive processes, such as fractional distillation (D_2O becomes concentrated in the liquid residue because it is less volatile than H_2O).

The heavy water is used as a moderator of neutrons in nuclear power plants. In the laboratory heavy water is employed as an isotopic tracer in studies of chemical and

biochemical processes.

Britannica, The Editors of Encyclopaedia. "Heavy water". ***Encyclopedia Britannica***, 13 Nov. 2019, https://www.britannica.com/science/heavy-water. Accessed 25 October 2021.

49. Plaster of Paris is made from

(1) Limestone (2) Marble (3) Gypsum (4) Bauxite.

Ans:3 (Made up of **gypsum**, the Plaster of Paris is a white colour powder. It is a popularly used substance for sculpting, casting, and gauze bandages. Chemically, it is calcium sulphate hemihydrates that are obtained from heating gypsum)

Plaster of paris, quick-setting gypsum plaster consisting of a fine white powder (calcium sulfate hemihydrate), which hardens when moistened and allowed to dry. Known since ancient times, plaster of paris is so called because of its preparation from the abundant gypsum found near Paris.

Plaster of paris does not generally shrink or crack when dry, making it an excellent medium for casting molds. It is commonly used to precast and hold parts of ornamental plasterwork placed on ceilings and cornices. It is also used in medicine to make plaster casts to immobilize broken bones while they heal, though many modern orthopedic casts are made of fibreglass or thermoplastics.

Britannica, The Editors of Encyclopaedia. "Plaster of paris". ***Encyclopedia Britannica***, 9 Feb. 2018, https://www.britannica.com/technology/plaster-of-paris. Accessed 15 October 2021.

50. Artificial rain is produced by seeding clouds with

(1) Potassium iodide (2) Silver iodide (3) Silver nitrate (4) copper sulphate

Ans:2