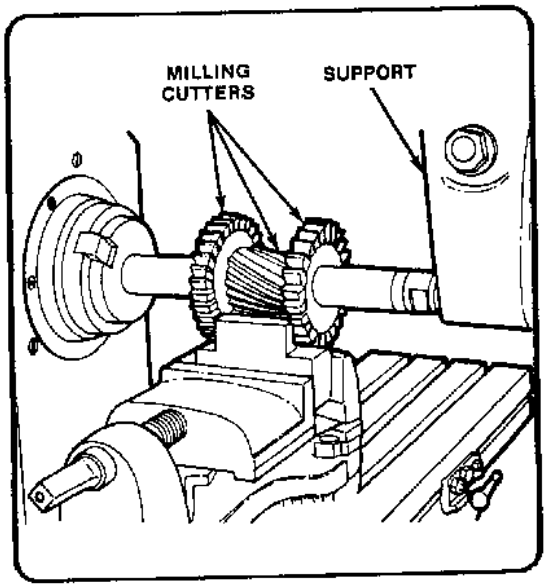
1. In Gang Milling
   1. Work is fed into the rotation of cutter
   2. More than one cutter is simultaneously used
   3. Work is done by gangs
   4. None of these

Ans: 2. (Gang milling refers to the **use of two or more milling cutters mounted on the same arbor** (that is, ganged) in a horizontal-milling setup. All of the cutters may perform the same type of operation, or each cutter may perform a different type of operation.)

GANG MILLING

Gang milling is the term applied to an operation in which two or more milling cutters are mounted on the same arbor and used when cutting horizontal surfaces. All cutters may perform the same type of operation or each cutter may perform a different type of operation. For example, several workpieces need a slot, a flat surface, and an angular groove. The best method to cut these would be gang milling as shown in Figure 8-32. All the completed workpieces would be the same. Remember to check the cutters carefully for proper size.



Gang milling

https://www.americanmachinetools.com/how_to_use_a_milling_machine.htm

2. Heat flews through solids only by:
   1. conduction
   2. convection
   3. radiation
   4. a combination of these

Ans: 1

3. In cars temperature indication is displayed for:
   1. Engine piston temperature
   2. Lubricating oil temperature
   3. Cooling water / engine jacket water
   4. Intake Air temperature

   Ans: 3

4. In cars pressure indication is displayed for:
   1. Combustion products
   2. Lubricating oil pressure
   3. Cooling water/ engine jacket water
   4. Intake Air

   Ans: 2

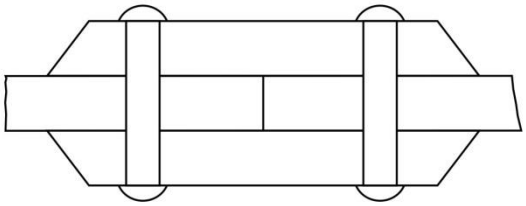
5. Falling rain drops become spherical due to:
   1. cohesion
   2. dynamic viscosity
   3. adhesion
   4. surface tension

   Ans: 4

6. A Barometer is used to measure:
   1. Pressure in a pipe line
   2. Very low pressures
   3. Atmospheric pressure
   4. None of these

   Ans: 3

7. What type of joint is the one:



   1. Lap Joint
   2. Butt Joint
   3. Butt joint with two cover plates
   4. None of these

   Ans: 3

8. The Octane rating of commercial petrol is:
   1. 85-90
   2. 90-100
   3. 100-110
   4. 110-120

Ans: 2 (Octane rating does not relate to the energy content of the fuel. It is only a measure of the fuel's tendency to burn rather than explode.)

The octane rating is a measure of the resistance of gasoline and other fuels to detonation (engine knocking) in spark-ignition internal combustion engines. High-performance engines typically have higher compression ratios and are therefore more prone to detonation, so they require higher octane fuel.

The octane number of a fuel is measured in a test engine, and is defined by comparison with the mixture of iso-octane and normal heptane which would have the same anti-knocking capacity as the fuel under test: the percentage, by volume, of iso-octane in that mixture is the octane number of the fuel. For example, gasoline with the same knocking characteristics as a mixture of 90% iso-octane and 10% heptane would have an octane rating of 90. Because some fuels are more knock-resistant than iso-octane, the definition has been extended to allow for octane numbers higher than 100.

https://www.pei.org/wiki/octane-number

9. The Cetane rating of commercial diesel oil is:

2. 85-90 2. 90-100 3. 100-110 4. 40-55

Ans: 4

Cetane number (CN) of a diesel engine fuel is indicative of its ignition characteristics. Higher the cetane number better it is in its ignition properties. Cetane number affects a number of engine performance parameters like combustion, stability, drivability, white smoke, noise and emissions of CO and HC. Biodiesel has higher Cetane number than conventional diesel fuel. This results in higher combustion efficiency and smoother combustion.

https://www.sciencedirect.com/topics/chemistry/octane-number

10. Buffing is:

1. Process of Electroplating
2. Etching Process
3. Process of bringing lustre on a stainless steel component surface
4. None of these

Ans: 3

Though stainless steel polishing or buffing often complement each other, the two processes differ greatly. Polishing is done through the use of abrasives, such as

wheels, belts and abrasive media. Just enough materials from the stainless steel part's surface is removed to allow for a final finish. Buffing, on the other hand, involves cloth-type wheels or non-aggressive media that brushes over the surface until the desired finish is achieved.
https://rpabrasives.com/services/polishing-buffing/stainless-steel/
……

WHAT IS BUFF POLISHING?

Buff polishing is a type of polishing method used to finish the surface of stainless steel.

"Buff" is the name of the tool that used for polishing the surface of stainless steel.

The stainless-steel surface is polished by the "buff" made of cotton or felt by its rotating.

Buff finishing also has the effect of removing burrs and scratches during processing and improve the surface smoothness.

https://nitto-stainless.com/en/buff/

11. Average cutting speed for machining mild steel a HSS tool is
    1. 10 m/mm
    2. 20 m/mm
    3. 30 m/mm
    4. 40 m/mm

    Ans: 3

12. Gantt Charts are used for :
    1. Inventory control
    2. Sales Forecast
    3. Machine utilization
    4. Production schedules

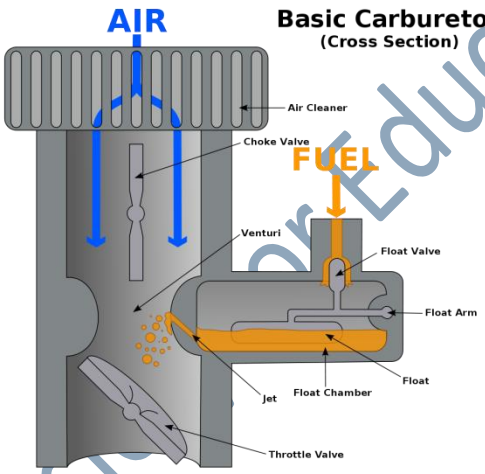
    Ans: 4 (A Gantt chart is used for **project planning**: it's a useful way of showing what work is scheduled to be done on specific days. It helps project managers and team members view the start dates, end dates and milestones of a project schedule in one simple stacked bar chart.) Ref. https://www.gantt.com/

13. A choke is applied in a car:
    1. for increasing speed
    2. for fuel economy
    3. for starting in cold weather
    4. to reduce speed

Ans: 3

In internal combustion engines with carburetors, a **choke valve** or **choke** modifies the air pressure in the intake manifold, thereby altering the air–fuel ratio entering the engine. Choke valves are generally used in naturally aspirated engines to supply a richer fuel mixture when starting the engine. Most choke valves in engines are butterfly valves mounted upstream of the carburetor jet to produce a higher partial vacuum, which increases the fuel draw. The choke is only used when starting a cold engine. When doing a cold start, the choke should be partially closed to limit the amount of air going in. This increases the amount of fuel in the cylinder and helps to keep the engine running, while it is trying to warm up. Once the engine has warmed up, a temperature sensing spring slowly opens the choke plate to allow the engine to breath fully.

https://en.wikipedia.org/wiki/Choke_valve



The original uploader was K. Aainsqatsi at English Wikipedia. (Original text: *en:User:K. Aainsqatsi*) - Transferred from en.wikipedia to Commons.

https://en.wikipedia.org/wiki/Choke_valve#/media/File:Carburetor.svg

14. The charge in a Diesel engine cylinder is:
    1. Air
    2. Air and Diesel
    3. Air, Diesel & LubE oil
    4. Diesel & LubE oil

Ans: 1

15. A stud is:
    1. screw with long threads
    2. screw with cylindrical head
    3. headless screw
    4. none of these

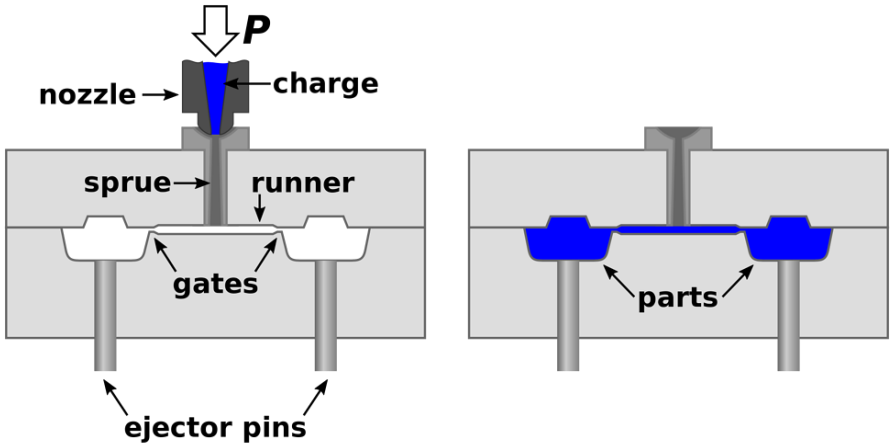
Ans: 3

16. A sprue hole is a:
    1. eccentric hole
    2. blind hole
    3. an opening in a mould into which molten metal is poured
    4. none of these

Ans: 3

A **sprue** is the vertical passage through which liquid material is introduced into a mold and it is a large diameter channel through which the material enters the mold. It connects pouring basin to the runner. In many cases it controls the flow of material into the mold. During casting or molding, the material in the sprue will solidify and need to be removed from the finished part. It is usually tapered downwards to minimize turbulence and formation of air bubbles.

https://en.wikipedia.org/wiki/Sprue_(manufacturing)



Source: https://blog.mrt-castings.co.uk/blog/sprues-flash-and-runners-explained

SPRUES AND RUNNERS.

Sprues and runners are created deliberately during the moulding process as the method in which the molten material enters the mould cavity. A sprue is a large diameter channel through which the material enters the mould. A runner is a smaller diameter channel that directs the molten metal is directed towards the individual part (particularly common when casting multiple parts at once). The part where the metal reaches its destination and begins to flow into the mould

cavity is called the 'gate'.

https://blog.mrt-castings.co.uk/blog/sprues-flash-and-runners-explained

17. Scraping of lathe bed helps in:
    1. Reducing friction
    2. It provides a true degree of flatness allowing two surfaces to smoothly glide across each other
    3. Good grip
    4. None of these

Ans: 2

MACHINE TOOL SCRAPING

Hand scraping is a manual process that requires an individual to use a hand tool called a flat scraper to scrap metal from a machine tool surface in order to create contact points and oil grooves on surfaces that need to be mated together. By removing very thin layers of metals from a precision surface, you eliminate the high points created by the machining process and provide a true degree of flatness allowing two surfaces to smoothly glide across each other. Machines that require scraping are those that contain boxed or cast-iron ways.

18. A surge tank is provided in Hydro-Power Schemes to:
    1. reduce water hammer pressure
    2. reduce friction in system
    3. strengthen the penstocks
    4. none of these

Ans: 1

A surge tank is often introduced in the system between the water intake and the powerhouse to absorb any water surges caused in the penstock or pressure tunnel due to sudden loading and unloading of the generator with opening and closing of inlet valve and wicket gates. The wicket gates of the turbine allows to regulate the amount of water that flows into the turbine.

19. Air resistance of car at 20 KMPH is R. The air resistance at 40 KMPH will be:
    1. R
    2. 2R
    3. R^2
    4. 4R

Ans. 4 (Air resistance $R \propto V^2$. $V \rightarrow 2V$ and therefore $R \rightarrow 4R$)

20. A Kaplan Turbine is suitable for:
    1. High head and low discharge
    2. Low head and low discharge
    3. Low head and high discharge

4. Very high head and medium discharge

Ans: 3

20.1 The negative plates of a lead acid battery has
1. lead peroxide (PbO_2)
2. spongy lead (Pb)
3. lead sulphate ($PbSO_4$)
4. sulphuric acid (H_2SO_4)

Ans.2

Positive plate: lead peroxide (PbO_2)

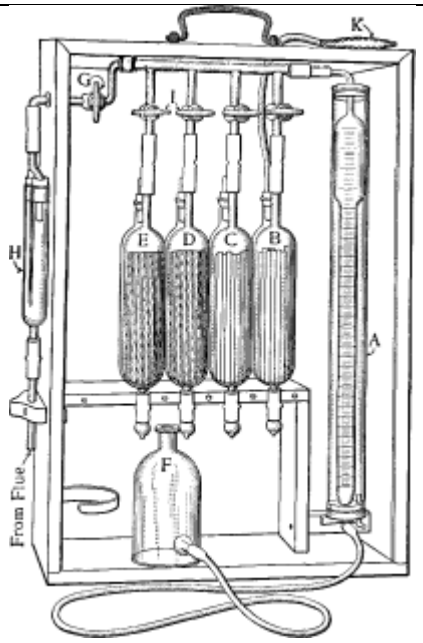
21. Orsat's Apparatus is used for:
1. Volumetric analysis of flue gas
2. Temperature of fuel gas
3. Pressure of fuel gases
4. None of these

Ans: 1

An Orsat gas analyser is a piece of laboratory equipment used to analyse a gas sample for its oxygen, carbon monoxide and carbon dioxide content on volume basis. It consists of a graduated measuring bottle also called as eudiometer, an aspirating bottle, three double reagant pipettes to absorb CO_2, O_2 and CO. Eudiometer is connected to aspirating bottle by means of rubber tube.Although largely replaced by instrumental techniques, the Orsat remains a reliable method of measurement and is relatively simple to us.

The most common absorbents are:

- Potassium Hydroxide (Caustic Potash) for carbon dioxide
- Pyrogallol (Pyrogallic Acid) for oxygen
- Copper(I) chloride (ammoniacal Cuprous chloride) for carbon monoxide
- https://en.wikipedia.org/wiki/Orsat_gas_analyser



Source:Babcock & Wilcox Co. - Obtained from ebook at Project Gutenberg, which is an electronic copy of the book "Steam Generation and its use" by Babcock & Wilcox co., 1919.
https://en.wikipedia.org/wiki/Orsat_gas_analyser

22. Percentage of Carbon is least in case of :
    1. Cast Iron
    2. Steel
    3. Wrought Iron
    4. Pig Iron

Ans: 3

Wrought iron is an iron alloy with a very low carbon content (less than 0.08%) in contrast to that of cast iron (2.1% to 4%). It is a semi-fused mass of iron with fibrous slag inclusions (up to 2% by weight), which gives it a "grain" resembling wood that is visible when it is etched or bent to the point of failure. Wrought iron is tough, malleable, ductile, corrosion resistant, and easily welded.

https://en.wikipedia.org/wiki/Wrought_iron

23. A 20 mm dia hole is to be punched in a 20 mm thick steel plate. If shear stress of steel is 30 kg/mm^2, the force required for punching will be in the range:
    1. 15-20 Tonne
    2. 20-25 Tonne
    2. 25-30 Tonne
    4. 35-40 Tonne

Ans: 4 (Force F to shear = $\pi dt\sigma_s$)

24. In a refrigeration cycle the heat is rejected by the refrigerant at:
    1. evaporator
    2. condenser
    3. compressor
    4. none of these

Ans:2

25. In a refrigeration cycle the heat is absorbed by the refrigerant at:

1.evaporator 2. condenser

3.compressor 4. none of these

Ans:1

26. In Rockwell Hardness Test the hardness is measured by:

1. diameter of Depression
2. depth of depression of an indenter
3. width of depression
4. none of these

Ans: 2

The Rockwell hardness tester utilizes either a steel ball or a conical diamond known as a brale and indicates hardness by determining the depth of penetration of the indenter under a known load. This depth is relative to the position under a minor initial load; the corresponding hardness number is indicated on a dial.

27. In Vicker's Hardness Test the hardness is measured by:

1.diameter of depression

2. the hardness number is equal to the load divided by the product of the lengths of the diagonals of the square impression.
3. width of depression
4. none of these

Ans: 2

Note: The Vickers hardness tester uses a square-based diamond pyramid indenter, and the hardness number is equal to the load divided by the product of the lengths of the diagonals of the square impression. Vickers hardness is the most accurate for very hard materials and can be used on thin sheets.

28. In Brienell Hardness Test the hardness is measured by:

1.diameter of depression of 10 mm ball

2.depth of depression

3.width of depression

4.none of these

Ans: 2

Hardness tester, device that indicates the hardness of a material, usually by measuring the effect on its surface of a localized penetration by a standardized rounded or pointed indenter of diamond, carbide, or hard steel.

Brinell hardness is determined by forcing a hardened steel or carbide ball of

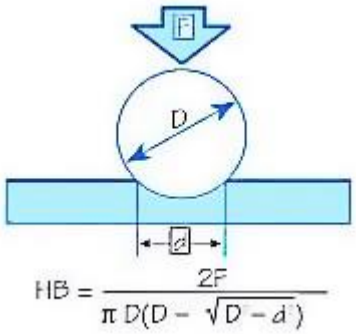
known diameter under a known load into a surface and measuring the diameter of the indentation with a microscope. The Brinell hardness number is obtained by dividing the load, in kilograms, by the spherical area of the indentation in square millimetres; this area is a function of the ball diameter and the depth of the indentation.

Britannica, The Editors of Encyclopaedia. "hardness tester". ***Encyclopedia Britannica***, 1 Feb. 2012, https://www.britannica.com/technology/hardness-tester. Accessed 27 October 2021.

The **Brinell hardness test method** as used to determine Brinell hardness, is defined in ASTM E10. Brinell testing often use a very high test load (3000 kgf) and a 10mm diameter indenter so that the resulting indentation averages out most surface and sub-surface inconsistencies.

Test Method Illustration

The Brinell method applies a predetermined test load (F) to a carbide ball of fixed diameter (D) which is held for a predetermined time period and then removed. The resulting impression is measured with a specially designed **Brinell microscope** or **optical system** across at least two diameters – usually at right angles to each other and these results are averaged (d). Common test forces range from 500 kgf often used for non-ferrous materials to 3000kgf usually used for steels and cast iron. There are other Brinell scales with load as low as 1kgf and 1mm diameter indenters but these are infrequently used.



$$HB = \frac{2F}{\pi D(D - \sqrt{D - d})}$$

where
D = Ball diameter
d = impression diameter
F = load

HB = Brinell hardness number

https://www.hardnesstesters.com/test-types/brinell-hardness-testing

The Shore scleroscope measures hardness in terms of the elasticity of the material. A diamond-tipped hammer in a graduated glass tube is allowed to fall from a known height on the specimen to be tested, and the hardness number depends on the height to which the hammer rebounds; the harder the material, the higher the rebound.

Britannica, The Editors of Encyclopaedia. "hardness tester". ***Encyclopedia Britannica***, 1 Feb. 2012, https://www.britannica.com/technology/hardness-tester. Accessed

29. Presence of sulphur in Pig Iron makes it:
    1. Hard
    2. Unsound casting
    3. Malleable
    4. Machineable

Ans: 2

30. The unit of kinematic viscosity is:
    1. m kg/sec
    2. kg sec/m^2
    3. m^2/sec
    4. none of these

Ans: 3

31. The difference between wet and dry bulb temperatures:
    1. Increases as air gets wet
    2. Increases as air gets drier
    3. Remains constant
    4. None of these

Ans:2

DRY BULB, WET BULB, AND DEW POINT TEMPERATURES

The **Dry Bulb**, **Wet Bulb** and **Dew Point** temperatures are important to determine the state of humid air. When the air is saturated with water vapor, then the water on the wet bulb cannot evaporate. Therefore, there is little difference in the temperature readings of the dry and wet bulbs of the psychrometer. In other words, the relative humidity is 100%.

WET BULB TEMPERATURE

The wet bulb temperature is always lower than the dry bulb temperature but will be identical with 100% relative humidity (the air is at the saturation line). Wet Bulb temperature can be measured by using a thermometer with the bulb wrapped in wet muslin. The adiabatic evaporation of water from the thermometer and the cooling effect is indicated by a "wet bulb temperature" lower than the "dry bulb temperature" in the air.

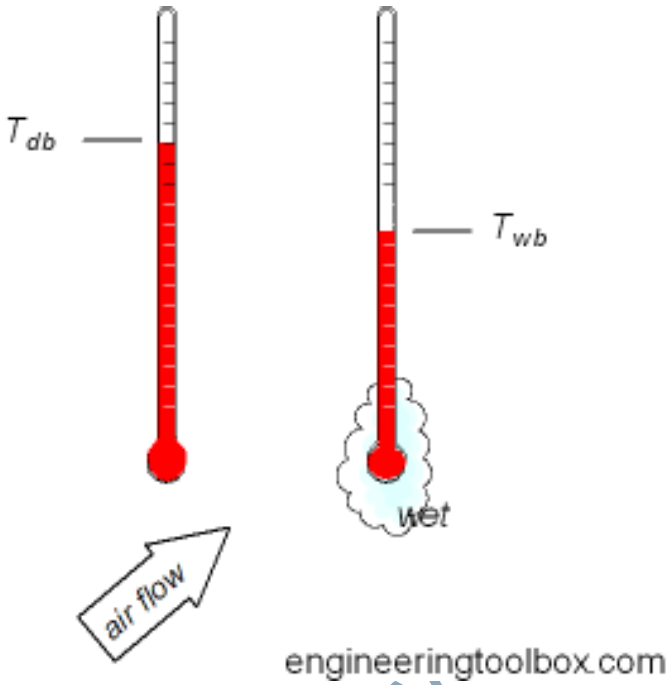
DRY BULB TEMPERATURE - T_{DB}

The Dry Bulb temperature, usually referred to as air temperature, is the air property that is most common used. When people refer to the temperature of the air, they are normally referring to its dry bulb temperature. It is called "dry bulb" because the air temperature is indicated by a thermometer not affected by the moisture of the air. The temperature is usually given in degrees Celsius (°C) or degrees Fahrenheit (°F). Wet bulb temperature is the temperature indicated by a

moistened thermometer bulb exposed to the air flow.

DEW POINT TEMPERATURE - T_{DP}

The **Dew Point** is the temperature at which water vapor starts to condense out of the air, the temperature at which air becomes completely saturated. Above this temperature the moisture will stay in the air.



https://www.weather.gov/source/zhu/ZHU_Training_Page/definitions/dry_wet_bulb_definition/dry_wet_bulb.html

32. In a reaction turbine while steam flows through fixed blades:
    1. Velocity of steam increases
    2. Pressure of steam decreases
    3. Velocity of steam decreases
    4. Velocity of steam increases while pressure drops

Ans:2

In Impulse turbine, the whole enthalpy drop (pressure drop) occurs in the nozzle itself. Hence pressure remains constant when the fluid pass over the rotor blades. Fig.1 shows the schematic diagram of Impulse turbine. In Reaction turbines, in addition to the pressure drop in the nozzle there will also be pressure drop occur when the fluid passes over the rotor blades as shown in Fig 2.

Steam turbines may be of two kinds, namely, (i) impulse turbineand (ii)Reaction turbine.

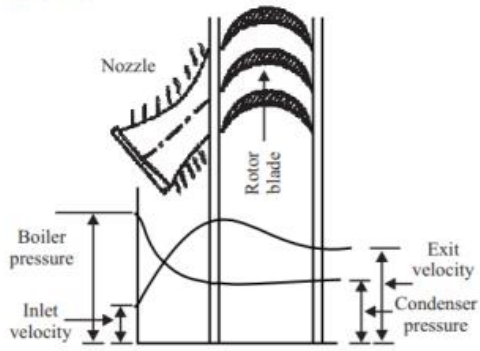


Fig.1 Impulse turbine

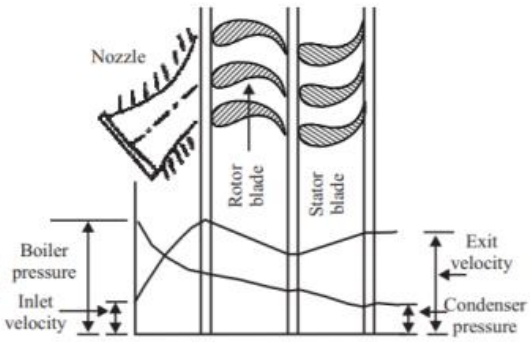


Fig.2 Reaction turbine

https://d13mk4zmvuctmz.cloudfront.net/assets/main/study-material/notes/mechanical_engineering_turbomachines_steam-and-gas-turbine_notes.pdf

33. If the roof of a house is replaced by a shiny metallic surface the temp inside will:

1. Increase slightly
2. Do not change
3. Decrease
4. Increase too much

Ans: 3 (the shiny metallic surface will reflect thermal radiation in better way)

A cool roof is one that has been designed to reflect more sunlight and absorb less heat than a standard roof. Cool roofs can be made of a highly reflective type of paint, a sheet covering, or highly reflective tiles or shingles. Nearly any type of building can benefit from a cool roof, but consider the climate and other factors before deciding to install one.

BENEFITS OF COOL ROOFS

A cool roof can benefit a building and its occupants by:

- Reducing energy bills by decreasing air conditioning needs
- Improving indoor comfort for spaces that are not air conditioned, such as garages or covered patios
- Decreasing roof temperature, which may extend roof service life.

Beyond the building itself, cool roofs can also benefit the environment, especially when many buildings in a community have them. Cool roofs can:

- Reduce local air temperatures (sometimes referred to as the urban heat island effect)
- Lower peak electricity demand, which can help prevent power outages
- Reduce power plant emissions, including carbon dioxide, sulfur dioxide, nitrous oxides, and mercury, by reducing cooling energy use in buildings.

TYPES OF ROOFS AND HOW THEY CAN BE MADE COOL

There are many types of roof systems available, but the surface exposed to the sun

is the one that determines if a roof is cool or not.

Cool roof coatings are white or special reflective pigments that reflect sunlight. Coatings are like very thick paints that can protect the roof surface from ultra-violet (UV) light and chemical damage, and some offer water protection and restorative features. Products are available for most roof types.

https://www.energy.gov/energysaver/cool-roofs

34. A ball is thrown vertically upwards with a velocity of 980 cm/sec. The time for the ball to come back to earth will be:

1. 2 sec 2. 1 sec 3. 4 sec 4. 5 sec

Ans: 1

35. For a simple pendulum the time period of one oscillation, T is given by:

1. $2\pi\sqrt{\frac{g}{l}}$ 2. $2\pi\sqrt{\frac{2l}{g}}$
3. $2\pi\sqrt{\frac{l}{2g}}$ 4. $2\pi\sqrt{\frac{l}{g}}$

Ans: 4 ($T = 2\pi\sqrt{\frac{l}{g}}$)

35.1 For a simple pendulum the frequency of oscillation, f is given by:

1. $\frac{1}{2\pi}\sqrt{\frac{g}{l}}$ 2. $2\pi\sqrt{\frac{2l}{g}}$
3. $2\pi\sqrt{\frac{l}{2g}}$ 4. $2\pi\sqrt{\frac{l}{g}}$

Ans: 1 ($f = \frac{1}{2\pi}\sqrt{\frac{g}{l}}$)

36. Spring stiffness is:

1. Load carrying capacity of spring
2. Load per unit area of base
3. Force per unit deflection
4. None of these

Ans: 3

37. If a circular cantilever beam of diameter D, cross section A, length L is subjected to uniformly distributed load W, it will have maximum bending moment equal to:

1. $\frac{WLA}{2}$ 2. $\frac{WL}{2}$
3. $\frac{WLD}{A}$ 4. $\frac{WL^2}{2A}$

Ans:2 (load x moment arm = WxL/2)

38. Steel castings are

1. weldeable
2. not weldeable
3. cannot stand impact
4. poor in strength

Ans: 1

39. The product from Cupola is:

1. Pig Iron
2. Steel
3. Cast Iron
4. Malleable Iron

Ans: 3

39.1 The product from blast furnace is:

1. Pig Iron
2. Steel
3. Cast Iron
4. Malleable Iron

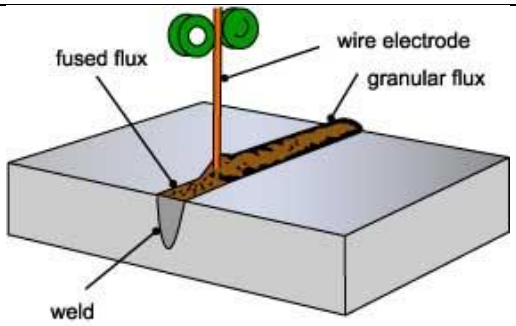
Ans: 1

40. In which welding process granular flux is used in the form of granules:

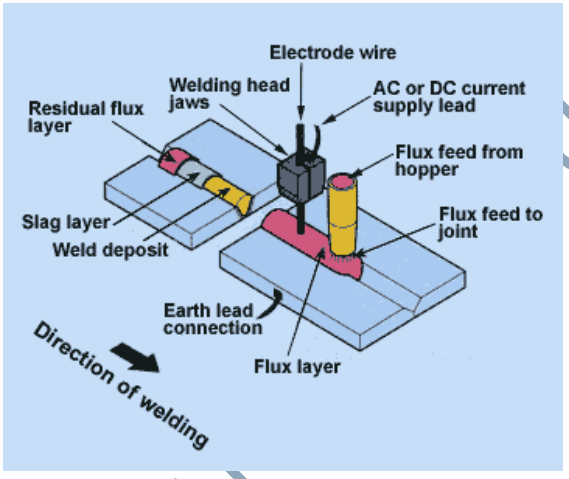
1. Submerged Arc welding
2. DC Arc welding
3. Gas welding
4. Argon welding

Ans: 1

Submerged Arc Welding (SAW) is a joining process that involves the formation of an electric arc between a continuously fed electrode and the workpiece to be welded. A blanket of powdered flux surrounds and covers the arc and, when molten, provides electrical conduction between the metal to be joined and the electrode. It also generates a protective gas shield and a slag, all of which protects the weld zone. A shielding gas is not required. The arc is submerged beneath the flux blanket and is not normally visible during welding. This is a well established and extremely versatile method of welding.



Source:https://www.twi-global.com/technical-knowledge/faqs/faq-what-is-submerged-arc-welding



Source: https://www.twi-global.com/technical-knowledge/job-knowledge/submerged-arc-welding-process-005

41. The input to Cupola is:

1. Pig Iron
2. Steel
3. Cast Iron
4. Malleable Iron

Ans: 1 (The Input to Cupola is **Pig Iron** which is obtained from a blast furnace.)

42. The process of Zinc Coating in Steel pipes is known as:

1. Pickling
2. Galvanising
3. Phosphating
4. Carburising

Ans: 2

Galvanizing Process

Hot-dip galvanizing is the process of immersing iron or steel in a bath of molten zinc to produce a corrosion resistant, multi-layered coating of zinc-iron alloy and zinc metal. While the steel is immersed in the zinc, a metallurgical reaction occurs between the iron in the steel and the molten zinc. This reaction is a diffusion process, so the coating forms perpendicular to all surfaces creating a uniform thickness throughout the part.

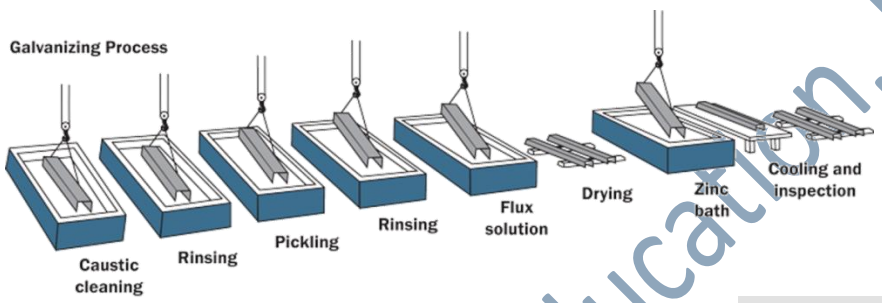


Figure 1: Model of the Hot-Dip Galvanizing Process (© 2021 American Galvanizers Association)

The three main steps in the hot-dip galvanizing process are surface preparation, galvanizing, and post-treatment, each of which will be discussed in detail. The process is inherently simple, which is a distinct advantage over other corrosion protection methods.

https://galvanizeit.org/inspection-course/galvanizing-process

43. Compression Ratio for Diesel engines is generally in the range of:

1. 5-10 2. 10-14 3. 14-22 4. 25-30

Ans: 3

44. Ignition coil in petrol engine is used to :

1. Step up current 2. Step down current
3. Step up voltage 4. Step down voltage

Ans: 3 (The ignition coil is a high voltage (low current) transformer that converts the vehicle's 12 volt power supply from battery to the 25-30,000 volts required to cross the gap of the spark plug, thus instigating combustion of air-fuel mixture.)

An **ignition coil** (also called a **spark coil**) is an induction coil in an automobile's ignition system that transforms the battery's voltage to the thousands of volts needed to create an electric spark in the spark plugs to ignite the fuel. Some coils have an internal resistor, while others rely on a resistor wire or an external resistor to limit the current flowing into the coil from the car's 12-volt

supply. The wire that goes from the ignition coil to the distributor and the high voltage wires that go from the distributor to each of the spark plugs are called spark plug wires or high tension leads. Originally, every ignition coil system required mechanical contact breaker points and a capacitor (condenser). More recent electronic ignition systems use a power transistor to provide pulses to the ignition coil. A modern passenger automobile may use one ignition coil for each engine cylinder (or pair of cylinders), eliminating fault-prone spark plug cables and a distributor to route

https://en.wikipedia.org/wiki/Ignition_coil

45. In a petrol engine during which stroke both suction and exhaust valves will remain closed

1. Suction stroke
2. Exhaust stroke
3. Both suction and exhaust stroke
4. Compression stroke

Ans: 4

46. 1 Bar pressure is equivalent to:

1. 735 mm Hg
2. 750 mm Hg
3. 100 mm Hg
4. 14.7 mm Hg

Ans: 1

47. The number of neutrons in a Hydrogen atom is

1. 1
2. 0
3. 2
4. none of these

Ans: 2

48. When a cubical block of ice 3 cm side is cut in to 27 equal cubes of side 1 cm, its surface area

Will

1. become reduced
2. get increased
3. remain same
4. none of the above

Ans: 2 (1. Surface area of a block of ice of side 'a', is $6a^2 = 54cm^2$ where a = 3cm

The total surface area of 27 small cubes of side a_1 =1 cm is 27 x $6a_1^2 = 162\ cm^2$)

49. A sample of water is called hard 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

WATER HARDNESS

water hardness is the amount of dissolved calcium and magnesium in the water. Hard water is high in dissolved minerals, largely calcium and magnesium.

Water systems using **groundwater** as a source are concerned with water hardness, since as water moves through soil and rock it dissolves small amounts of naturally-occurring minerals and carries them into the **groundwater supply**. Water is a great **solvent** for calcium and magnesium, so if the minerals are present in the soil around a water-supply well, hard water may be delivered to homes/industries.

In areas of the country where the water is relatively hard (see map below), industries might have to spend money to soften their water, as hard water can damage equipment. Hard water can even shorten the life of fabrics and clothes.

https://www.usgs.gov/special-topic/water-science-school/science/hardness-water?qt-science_center_objects=0#qt-science_center_objects

50. Which of the following quantity is not a vector quantity?

1. Momentum
2. Torque
3. Energy
4. Impulse

Ans:3

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