1. Where is the highest railway in the world?
   1. Peru 2. Kathmandu 3. Argentina 4. None of these

   Ans:1

The Qinghai-Tibet railway in China, completed in October 2005, is the worldâ€™s highest railway. Most of the 1,956-km-long line lies at 4,000 m (13,123 ft) above sea level, with the highest point reaching an altitude of 5,072 m (16,640 ft).
Tanggula Mountain railway station, which at 5,068 m will be the world's highest (CÃ³ndor station, at 4,786 m, on the Rio Mulatos-PotosÃ line, Bolivia, and La Galera at 4,781 m in Peru being the next highest.
https://www.guinnessworldrecords.com/world-records/highest-railway-line

……
https://en.wikipedia.org/wiki/List_of_highest_railways

With its highest point at an altitude of 5,072m – 200m or more above the Peruvian railway in the Andes – **Qinghai-Tibet** easily takes the title as the world's highest track and Tanggula Station, a mere 4m lower, the highest railway station. It is also the longest plateau railway in the world.

2. Which city lies partly in Europe and partly in Asia?
   1. Budapest 2. Isthanbul 3. Ankara 4. Kieu

   Ans: 2

3. Who started the Scout movement?
   1. Bardan Powell 2. Lenoard Chestine
   3. Geu Scuutz 4. Eisenhower

   Ans: 1

4. Where is the headquarters of the World Food and Agriculture Organsiation?
   1. Rome 2. Paris 3. Dublin 4. New York

   Ans: 1

5. Which is the hardest natural substance known to man?
   1. Diamond 2. Iron 3. Graphite 4. Steel

   Ans: 1

6. Quicksilver is a popular name for
   1. Silver 2. Mercury 3. Stainless Steel 4. Platinum

   Ans: 2

7. A 'lead' pencil is a misnomer because it actually contains
   1. coal 2. carbon 3. graphite 4. clay

   Ans: 3

8. The ability of an organism to replace structure or organs is called
   1. replacement 2. regeneration
   3. rejuvenation 4. replenishment

   Ans: 2

9. GATT is a
   1. trade related agreement between countries
   2. scientific agreement between countries
   3. cultural agreement between countries
   4. none of the above

   Ans:1

10. Who discovered Television?
    1. James Maxwell 2. Ernest Rutherford
    3. John Logie Baird 4. None of the above

    Ans: 3

11. Which of these poets was blind?
    1. Milton 2. Shakespeare
    3. Shelly 4. Bernad Shaw

    Ans:1

12. A train travels between two stations 15 km apart in 18 minutes. If it accelerates followed immediately by uniform deceleration, the maximum speed by the train is:
    1. 60 km/hr 2. 80 km/hr
    3. 100 km/hr 4. 125 km/hr

    Ans:3

13. Cyaniding is a process of:
    1. Case Hardening 2. Annealing
    3. Tempering 4. None of these

    Ans:1

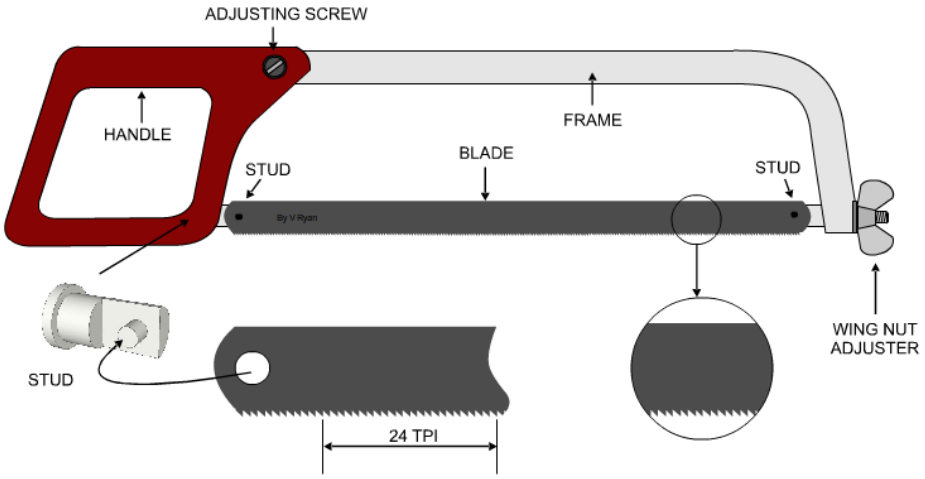
14. A hacksaw Blade cuts on:

1. Forward stroke
2. Return stroke
3. Both designs available - options 1 and 2
4. Depends on blade design

Ans:3

The hacksaw is used to cut steel and other metals. It can also be used to cut plastics, although it is not normally used to cut woods. It is sometimes called an adjustable hacksaw because the length of the frame can be altered to hold blades of different sizes. Blades are supplied in two lengths, 250mm and 300mm. If the adjusting screw is unscrewed, the frame can be pushed into the handle so that the smaller blades fit the hacksaw.

Blades are also described by the number of teeth per inch (TPI). Blades have 14, 18, 24, 32 teeth per 25mm (inch). A blade with 14 TPI is coarse whilst a blade with 32 TPI is very fine.



https://technologystudent.com/equip_flsh/hacksw1.html

www.technologystudent.com

15. A Hygrometer is used to measure:

1. Relative Humidity
2. Viscosity
3. Buoyancy
4. Specific Gravity of Liquid

Ans: 1

16. A Hygrometer is used to measure:

1. Relative Humidity
2. Viscosity
3. Buoyancy
4. Specific Gravity of Liquid

Ans: 1

17. Shanks of taper drills are provided with standard taper known as:
    1. Sellers taper
    2. Chapman taper
    3. Morse taper
    4. Brown and Sharpe taper

    Ans: 3

18. Which one of the following measuring instruments is most accurate:
    1. Micrometer
    2. Vernier
    3. Scale
    4. Optical projector

    Ans: 1

19. Dilution of lubricating oil in Diesel engines known as 'fuel dilution' is due to:
    1. Water
    2. Dust
    3. Diesel oil
    4. None of these

    Ans:3

    As fuel is burned during the combustion cycle, it can enter the crankcase and be introduced to the lubricating oil. The process of the raw or unburned fuel mixing with the oil is known as fuel dilution. There are many causes of fuel dilution, with most related to some sort of mechanical issue.

    Perhaps the most common reason fuel dilution occurs is due to a process known as blow-by. If the piston rings are damaged or dirty, they may not seal properly. These rings are designed to keep the oil and the exhaust separated and are critical in ensuring proper compression in the cylinder. When fuel mixes with the lubricant, it **reduces the viscosity of the oil**, meaning that the viscosity may be too low to create an oil film capable of withstanding heavy loads and speeds in some parts of the engine. This results in friction between the metal surfaces and wear of the parts, i.e., fuel thins the oil to the point where it cannot support the load in the engine or build a sufficient film to keep the engine parts separated.

    https://www.machinerylubrication.com/Read/31148/fuel-dilution-tests

20. Process of oxide coating on Aluminium is:
    1. Oxidizing
    2. Anodizing
    3. Galvanizing
    4. None of these

    Ans:2

21. Addendum is:
    1. depth of a gear tooth
    2. depth of tooth space below the pitch circle
    3. height by which tooth projects beyond the pitch circle
    4. none of the above

    Ans:3

22. Deddendum is:

1. depth of a gear tooth

2. depth of tooth space below the pitch circle

3. height by which tooth projects beyond the pitch circle

4. none of the above

Ans:2

22. Common solder consists of:

1. Lead & Tin
2. Tin and White metal
3. Zinc & Tin
4. Tin and Antimony

Ans:1

23. Moisture in a refrigeration system is removed by:

1. Driers
2. Coolers
3. Evaporator
4. None of these

Ans:1

Box:1

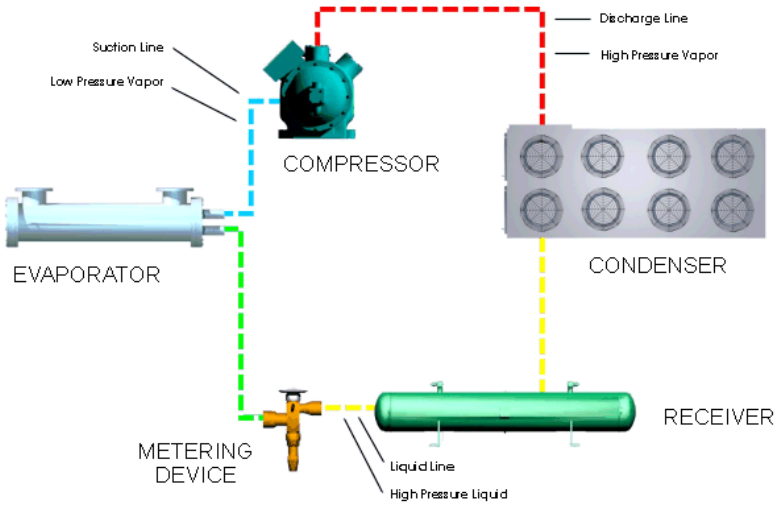
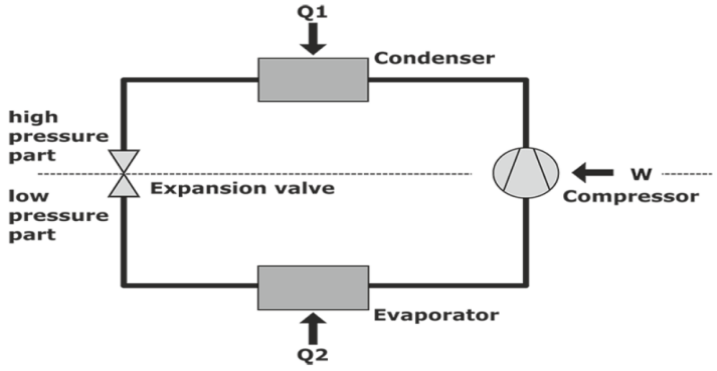


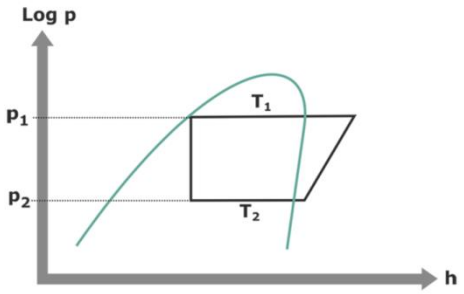
Fig. 1-1: Simple Refrigeration System.(https://berg-group.com/engineered-solutions/the-science-behind-refrigeration/)

The suction line connects the evaporator or cooling coil to the compressor, the hot gas or discharge line connects the compressor to the condenser, and the liquid line is the connecting tubing between the condenser and the metering device (Thermal expansion valve). Some systems will have a receiver immediately after

the condenser and before the metering device, where the refrigerant is stored until it is needed for heat removal in the evaporator.

Box:2





$$(2)\quad COP_{hp} = \frac{Q_1}{\sum W} = \frac{T_1}{T_2 - T_1}$$

$$(3)\quad COP_{ref} = \frac{Q_2}{\sum W} = \frac{T_2}{T_2 - T_1}$$

https://www.swep.net/refrigerant-handbook/2.-compression-cycle/zx/

24. The process of reheating hardened steel to temperature below the lower critical temperature followed by any desired rate of cooling is called:

1. Hardening
2. Annealing
3. Tempering
4. Normalising

Ans:3

25. A thin cylinder of diameter *d*. wall thickness *t* is subjected to an internal p. The longitudinal stress will be:

1. $\frac{\pi pd}{4t}$
2. $\frac{pd}{4\pi t}$
3. $\frac{pd}{4t}$
4. $\frac{pd}{2\pi t}$

Ans:1

25.1 A thin cylinder of diameter *d*. wall thickness *t* is subjected to an internal pressure, p. The
Hoop stress will be:

1. $\frac{\pi pd}{4t}$ 2. $\frac{pd}{4\pi t}$ 3. $\frac{pd}{4t}$ 4. $\frac{pd}{2t}$

Ans:4

26. The safe working pressure for a spherical vessel 1.5 m diameter and 1.5 cm with limiting tensile stress of 450 kg/cm^2 is:
1. 18 kg/cm^2 2. 9 kg/cm^2 3. 36 kg/cm^2 4. 4.5 kg/cm^2

Ans:1

27. Sintered bearing are used for :
1. Underwater application
2. Slow rpm applications
3. Places where oiling/lubrication in regular interval is difficult; they are self lubricating
4. None of the above

Ans:3 (Sintered bearing are self lubricating)

28. Core prints are provided to :
1. Direct the flow of molten metal during pouring
2. Reinforce the core
3. Form seat to support and hold the core
4. None of the above

Ans:3

29. Bleeding in steam turbine refers to

1. leakage of steam through bearings
2. leakage of steam through packings
3. purposely withdrawn steam from turbine for feed water heating
4. none of the above

Ans:3

30. "Killed" steel is:

1. Steel which has been shaped on hammer
2. Steel with higher carbon in it
3. Steel which has been deoxidized with Aluminium & Silicon
4. Steel which has lost its properties due to excess alloy elements

Ans:3

31. In case of a circular shaft subjected to torque, the value of shear stress:
    1. Uniform throughout
    2. Maximum at axis
    3. Zero at axis and linearly increases to a maximum value at surface
    4. Minimum at surface

    Ans:3

32. In case of Metre Gauge Railway Track the distance between the rails is:
    1. 5' 6" 2. 1 meter 3. 4' 6" 4. 3' 6"

    Ans:2 (e.g., NMR of Southern railway. NG is adopted in Kalka-Simla and Darjeeling mountain railways)

33. Purpose of supercharging an engine is to:
    1. Increase power output 2. Reduce noise
    3. Reduce temperature in cylinders 4. None of these

    Ans:1 (Supercharging is a thermodynamic process which helps to increase the suction pressure of I.C. Engines above the atm. pressure. The main object of supercharging is to increase the induction air mass per cycle and permit the burning of a larger amount of fuel and thus increase the power output of the engine.)

34. The general Gas Equation is:
    1. PT = RT 2. PV = mRT
    3. $PT = (RT)^m$ 4. PV^n = Constant

    Ans:2

35. Hammer blow in pipe lines occurs when:
    1. Pipe is hit with hammer
    2. Excessive leak in pipe takes place
    3. Valve in pipe line is closed gradually
    4. Valve installed in a pipeline is closed suddenly

Ans: 4

Water hammer is a shock wave, usually generated by the rapid closure of a valve, but occasionally caused by a pressure wave resonance within a pipe. A water hammer is not limited to water, and can be used to describe the surge in pressure of any liquid contained in a pipeline.
The surge in pressure caused by water hammer can have several negative effects. If the pressure caused by the water hammer is greater than the yield limit of the pipeline material then a blow out or pipeline rupture can occur. Another consequence of water hammer is the sound of the pressure increase, which can be particularly annoying in a home or office environment.

https://www.corrosionpedia.com/definition/6276/water-hammer

36. In which type of welding exothermic reaction is employed:

1. Arc welding
2. MIG
3. TIG
4. Thermit welding

Ans: 4

Thermit material is a mechanical mixture of metallic aluminum and processed iron oxide. Molten steel is produced by the thermit reaction in a magnesite-lined crucible. At the bottom of the crucible, a magnesite stone is burned, into which a magnesite stone thimble is fitted. This thimble provides a passage through which the molten steel is discharged into the mold.
……..

In the aluminothermic welding process, molten steel is poured into a mould surrounding the gap between the rail ends to be joined. The rail ends are connected by the liquid metal. The principle of aluminothermic welding is based on an exothermic chemical reaction of aluminium powder and iron oxide, producing sufficient heat to cause melting.

Before melting can start, the ends of the rails are cut to create a specified gap and the rails are aligned. Then a refractory mould is fastened around the gap by means of steel mould shoes. Leaks in the moulds are prevented by special luting material. After pre-heating both rail ends the exothermic reaction of the aluminium powder and iron oxide is started in a re-usable or a 'one-shot' crucible and the liquid metal flows into the mould. The metal fills the mould and the slag is discharged into slag bowls. After a cooling period the excess metal at the head of the rail is removed and grinding of the rail can commence.

As the welding quite often takes place in tracks which are in use, the speed of the welding operation and the safety of the welders are important aspects of welding on railway tracks.

https://www.twi-global.com/contact

https://www.twi-global.com/technical-knowledge/published-papers/requirements-for-the-european-education-of-railway-track-welders-in-aluminothermic-welding-june-2006

37. For a cutting speed of 30 m/min, a workpiece 100 mm dia will have is N RPM. If the diameter of the workpiece is reduce to 50 mm, to maintain the speed the spindle RPM will be:

1. 96 RPM
2. 192 RPM
3. 64 RPM
4. 128 RPM

Ans: 2 .

V = $\frac{\pi DN}{1000}$ = 30 m/min. → $\frac{\pi x100xN}{1000}$ = 30. If ID becomes D/2, V → 2 times the initial velocity, i.e., 192 m/min.

38. An automobile gear box utilizes:

1. Simple gear train
2. Compound gear train
3. Epicyclic gear train
4. None of these

Ans: 2

A **transmission** is a machine in a power transmission system, which provides controlled application of power. Often the term *5-speed transmission* refers simply to the **gearbox**, that uses gears and gear trains to provide speed and torque block conversions from a rotating power source to

another device.

The term *transmission* properly refers to the whole drivetrain, including clutch, gearbox, prop shaft (for rear-wheel drive vehicles), differential, and final drive shafts.

Often, a transmission has multiple gear ratios (or simply "gears") with the ability to switch between them as the speed varies. This switching may be done manually (by the operator) or automatically (by a control unit). Directional (forward and reverse) control may also be provided. Single-ratio transmissions also exist, which simply change the speed and torque (and sometimes direction) of motor output.

In motor vehicles, the transmission generally is connected to the engine crankshaft via a flywheel or clutch or fluid coupling, partly because internal combustion engines cannot run below a particular speed. The output of the transmission is transmitted via the driveshaft to one or more differentials, which drive the wheels. While a differential may also provide gear reduction, its primary purpose is to permit the wheels at either end of an axle to rotate at different speeds (essential to avoid wheel slippage on turns) as it changes the direction of rotation.

https://en.wikipedia.org/wiki/Transmission_(mechanics)

39. A piece of metal of specific gravity 3.4 floats in Mercury of specific gravity 13.6; what fraction of its volume is under Mercury?

1. full 2. 0.25 3. 0.75 4. 0.9

Ans: 3 { (13.6 -3.4)/13,6}

Fraction of its volume above Mercury = 3.4/13.6

40. Air-standard efficiency of an IC engine mainly depends on:

1. Compression Ratio
2. Speed
3. Fuel Type
4. None of these

Ans: 1.

1. For a thermodynamic cycle, thermal efficiency, $\eta_{th} = \frac{W_{net}}{Q_H} = \frac{Q_H - Q_L}{Q_H} = 1 - \frac{Q_L}{Q_H}$

2. Thermal efficiency of $\eta_{th.otto} = 1 - \frac{1}{r^{k-1}}$
   where $r = \frac{v_{max}}{v_{min}} = \frac{V_1}{V_2} = \frac{v_1}{v_2}$

3. Thermal efficiency of diesel cycle
   $\eta_{th} = 1 - \frac{1}{r^{k-1}} \left[\frac{r_c{}^k - 1}{k(r_c - 1)}\right]$

where the compression ratio, r = $\frac{V_1}{V_2} = \frac{V_4}{V_2} \neq \frac{V_4}{V_3}$ and the cut off ratio, $r_c = \frac{V_3}{V_2}$

41. The shape of the lid of manhole in a boiler is:

1. Elliptical
2. Circular
3. Square
4. Rectangular

Ans: 1

42. Weld spatter in welding process is a:

1. Flux
2. Filler Metal
3. Welding defect
4. None of these

Ans: 3

43. The crowning of flat pulleys is generally done:

1. To reduce belt friction
2. To prevent the belt from running-off the pulley
3. To increase pulley life
4. None of these

Ans: 2

44. A steady rest is used with a lathe for turning:

1. Long Jobs
2. Large Diameter Jobs
3. Taper Turning
4. Irregular Jobs

Ans:1

Steady rests and follower rests were developed to remedy the lathe turning deflection problem. Steady rests and follower rests hold a long workpiece steady during turning. Steady rests are mounted to the lathe bed and do not move with the lathe. They ensure concentricity, but limit the length of the supporting cut. Also, to achieve the best results in turning, vibration must be kept to a minimum. Typically, steady rests are selected to provide support for longer cuts. Both steady rests and follower rests are used with cylindrical parts and round stock. They are also used to keep the workpiece from wobbling and to ensure that a drilled hole will be concentric with the outside diameter (OD)

of the part.

Follower rests are so named because they attach to the saddle (the lathe component that holds the tool) and move along with or "follow" the cutting tool. Some long slender shafts that tend to whip and spring while they are being machined require the use of a follower. The follower rest is fastened to the carriage and moves with the cutting tool. The follower rest is often used when long, flexible shafts are threaded. At the completion of each threading cut, care must be taken to remove any burrs that may have formed to prevent them from causing the work to move out of alignment.

https://www.globalspec.com/learnmore/manufacturing_process_equipment/machine_tool_accessories/steady_rests_follower_rests

45. A steam trap is a device that:
    1. Separate condensate from steam
    2. Superheat the steam
    3. Add moisture to steam
    4. None of the above

    Ans: 1

46. ABC analysis is used in:
    1. CPM
    2. PERT
    3. Inventory Control
    4. None of these

    Ans:3

47. The main advantage of using worm gears is to obtain:
    1. low power loss
    2. high velocity ratio
    3. less cost
    4. none of these

    Ans:2

48. A product layout is generally suggested for:
    1. Jobbing Work
    2. Continuous batch production
    3. Heavy items to customer specification
    4. None of these

    Ans: 2

The product layout can be defined as an arrangement of various machines run to produce the final product in a prescribed order. Machines are placed in such a way that

the output of one machine becomes the input of the next machine.

In a process layout similar machines and equipment of the same functional type are arranged in one department. The processes are segregated and the machines of each process are kept together while each process is kept separately.

49. A sine bar is used to measure:
    1. Surface Roughness
    2. Gear Profile
    3. Length
    4. External Taper

    Ans: 4

50. Bagasse is:
    1. Type of coal
    2. Type of wood fuel
    3. Rice straw
    4. Fibre portion of sugarcane after removing juice

    Ans: 4