1. In a class , the number of boys is more than the number of girls by 24% of the total strength of the class. The ratio of boys to girls is:

(1) 1:3 (2) 21:17 (3) 31: 19 (4) 35:19

Ans: 3

2. The unit of magnetic moment is

(1) Weber (2) Ampere.meter square ($A.m^2$)

(3) Weber per meter (4) Tesla

Ans: 2

3. Covalent bond is formed by

(1) Gain of electrons (2) loss of electrons

(3) Sharing of pairs of electrons (4) exchanging electrons

Ans:3

4. The abrasive used for honing of non ferrous metals is

(1) Boron carbide (2) Diamond

(3) Silicon carbide (4) Aluminium oxide

Ans:3

Silicon Carbide Silicon Carbide (SiC) is a pure synthetic product and is produced from quartz sand and coke heated in an electric resistance furnace to approximately 2200 °C. One differentiates between green and black silicon carbide, which has a slightly higher toughness. Silicon Carbide is harder, more brittle and sharper edged than alumina. Silicon Carbide is mainly used on hard and brittle materials e.g. grey cast iron, tungsten carbide and non-ferrous metals.

Honing stone hardness. The hardness denotes the strength by which each particle of grain is retained by the bonding within the honing stone. The hardness is identified by a number for vitrified honing stones with a grit size of 150 and finer; 200 represents an extremely soft stone and 0 an extremely hard stone. The honing stone hardness for grit sizes 120 and coarser are identified in a similar way to grinding wheels by using an alphabetical letter from A for very soft to Z for very hard.

http://www.ptp-tech.com/downloads/Atlantic%20Honing%20stones.pdf

5. Application of a load for a specified period of time on an indentation tool is used in the

(1) Vicker hardness test
(2) Brinnel hardness test
(3) Shore test
(4) Rockwell hardness test

Ans:4

Hardness describes the resistance that a material exhibits to permanent indentation or marking by scratches. Hardness is not a material property, rather a value ascribed to a material as a result of empirical testing.

There are six main hardness tests that can be carried out: Vickers, Rockwell, Brinell, Mohs, Shore and Knoop. Which one to apply depends on the type of material to be tested and the equipment available. Most hardness tests involve using machinery that indents the material over a certain time period, applying a predetermined force or loading.

MOHS HARDNESS TEST

The Mohs hardness test is one of the earliest attempts at defining and comparing the hardness of mineral materials. The Mohs scale consists of values from 1 to 10, which correlate with the ability of the test material to withstand scratching by progressively harder minerals. It is typically used for geological purposes.

The Mohs scale of mineral hardness is as follows:

Talc
Gypsum
Calcite
Fluorite
Apatite
Feldspar
Quartz
Topaz
Corundum
Diamond

SHORE HARDNESS TEST

The Shore test involves using a spring-loaded indenting machine to measure the hardness of a material. The Shore hardness test is typically used to qualify and compare the hardness of polymers such as plastics or rubbers.

There are two types of Shore scale used - A and D. They both use a different diameter for the needle-shaped indenter tip and are applied to different types of

material.

BRINELL HARDNESS TEST

The Brinell hardness test was the first standardised test to be widely used, especially on metals. It is defined in ASTM E10. The testing process involves pressing a carbide ball indenter into the surface of the test material over a set period of time with a constant applied force.
The most frequently used forces range between 500 kgf (typically used for non-ferrous metals) to 3000 kgf (typically used for steel).

The result of the testing process is a round indentation that can be measured and used along with the applied load to calculate a hardness value. The disadvantages of the Brinell test are that it is slow compared to other methods and is destructive, leaving a large indentation in the test sample.

ROCKWELL HARDNESS TEST

The Rockwell test is probably the most commonly used hardness test today, mainly since it is the fastest and most accurate form of testing. It is defined by the standard ASTM E18.
There are three stages to the Rockwell hardness test. A preliminary load is applied by a diamond or ball indenter for a short period of time. The preliminary load is then removed and the indentation is measured. The load is subsequently increased and applied, known as the major load. The major load is then released, and the preliminary load re-applied for a short time. The indenter is removed and the final indentation measured. The Rockwell hardness value of the material is calculated from the difference between the final and preliminary indentation depth measurements.

Applied forces range between 15 kgf and 3000 kgf depending on the test material type.

VICKERS HARDNESS TEST

The Vickers hardness test is known as a ‘microhardness’ test, which means it is typically used for small or thin material sections. Micro-indentation testing of materials is defined by ASTM E384.
The testing process involves using a diamond indenter to apply a light force to the surface of the material and the depth is measured optically. Due to the small indentation, the surface of the material must be smooth and highly-polished.

The typical loading values range between 10 g to 1 kgf, although ‘macro’ loads are infrequently used that extend up to 30 kgf.

KNOOP HARDNESS TEST

Similar to the Vickers test, the Knoop hardness test is used on small and thin parts, using loads of 1 kgf or less.

The process is identical to the Brinell hardness test but uses a rhombus-shaped indenter and a microscopic measurement system.

https://matmatch.com/learn/process/hardness-comparison

6. The most common method employed for turning steep tapers is

(1) swiveling the compound rest/slide

(2) form tool plunging

(3) offsetting the tailstock method

(4) the combination of the lathe compound slide and the cross-slide

Ans:1

https://mytutorialworld.com/objective-questions/questions_view.php?table_name=machinist_set_1_lathe&title=Lathe%20Objective%20Questions%20-%20Machinist(Set-1)%20with%20Answers

For taper turning on center lathes, the method of swivelling the compound rest is preferred for:

A. Long jobs with small taper angles

B. Long jobs with steep taper angles

C. Short jobs with small taper angles

D. Short jobs with steep taper angles

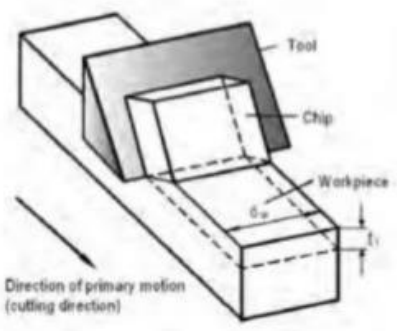
7. The main advantage of orthogonal cutting is

(1) It gives good finish (2) it increases the life of the tool

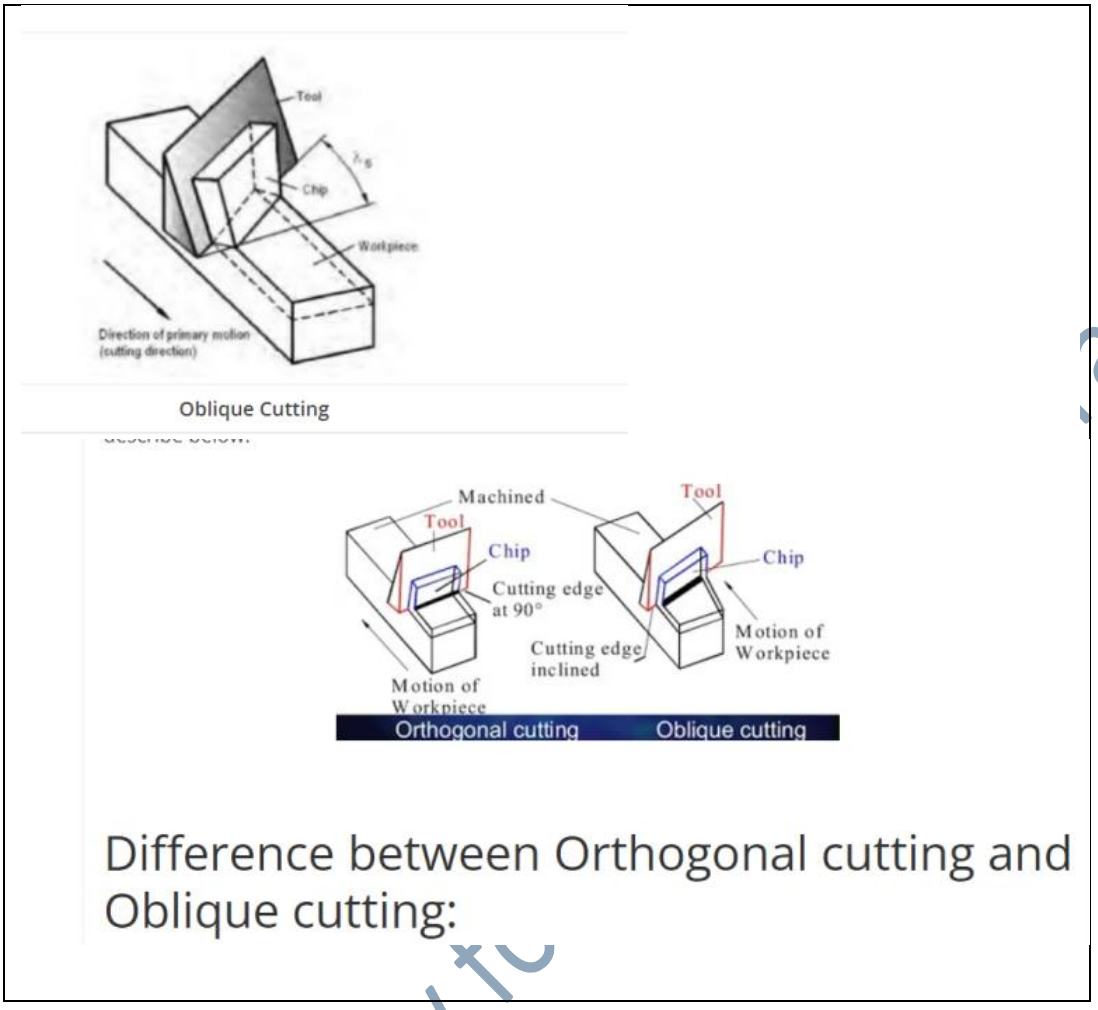
(3) It distributes load on a larger area (4) it increases the load at the cutting edge

Ans:

ifference between Orthogonal and Oblique Cutting



Orthogonal Cutting



8. The method of hardness testing carried out on big machine components which cannot be carried to a testing machine is the

(1) Shore test
(2) Brinnel harness test
(3) Vickers hardness test
(4) Rockwell hardness test

Ans:1

9. Which of the following statements is correct about an independent four jaw chuck?

(1) It is not to be used for round jobs
(2) The jaws move simultaneously
(3) The jaws can be reversed and assembled
(4) The jaws cannot be used in reversed portion to hold work

Ans:3

Three-jaw universal chuck

Three-jaw universal chuck is used to hold round and hexagonal work. It grasps the work quickly and within a few hundredths of a millimeters or thousandths of an inch of accuracy, because the three jaws move simultaneously when adjusted by the chuck wrench. This simultaneous motion is cause by a scroll plate into which all here jaws fit. Three jaws chucks are made in various sizes from 1/8-16 inch in diameter. They are usually provided with two sets of jaws, one for outside chucking and the other for inside chucking.

Four-jaw independent chuck

This four- jaw independent chuck has four jaws; each of which can be adjusted independently by a chance wrench. They are used to held wound, square, hexagonal, and irregular-shaped workpieces. The jaws can be reversed to hold work by the inside diameter.

Figure 2: Four-jaw independent chuck

Collect chuck

The collect chuck is the most accurate chuck and is used for high precision work and small tools. Spring collects are available to hold round, square, or hexagon shaped workpieces. A adaptor is filled into the taper of the headstock spindle, and a hollow draw bar having an internal thread is instead in the opposite end of the headstock spindled. As the hand wheel and draw bar is revolved, it draws the collet into the tapered adaptor, causing the collet to tighten on the workpieces.

The Jacob collect chuck has a wider range the spring collect chuck. Instead of a draw bar, it incorporates an impact-tightening hand wheel to close the collect on the workpiece. A set of II rubber flex collects, each capable of a range of almost 1/8 in, makes it possible to hold a wide range of work diameter. When the hand wheel is turned clockwise, the rubber flex collect is forced into a taper, causing it to tighten on the workpiece. When the hand wheel is turned counterclockwise, the collect opens and releases the workpiece.

Magnetic chucks

A magnetic chucks are used to hold iron or steel parts that are too thin, or that may be damaged if held in a conventional chuck. These chucks are fitted to an adaptor mounted on the headstock spindle. Work id held lightly for aligning purposes by turning the chuck wrench approximately ¼. After the work has been turned

Faceplates

A faceplates are used to hold work that is too large or of such a shape that it cannot be held in a chuck or between centers. Faceplates are equipped with several slots to permit the use of bolts to secure the work, so that the axis of the

workpiece may be aligned with the lathe centers. When work is mounted off – center, a counterbalance should be fastened to the faceplate to prevent imbalance and the resultant vibrations when the lathe is in operation.

tps://openoregon.pressbooks.pub/manufacturingprocesses45/chapter/unit-3-chucks/

…….

4 jaw chuck

Some of its advantages are:

superior accuracy, letting you indicate a part or feature as closely as you desire;
holding odd- or irregularly shaped parts, including hexagons;
holding square or rectangular parts;
holding parts or features off the center of rotation;
automatically compensating for chuck wear; and
superior gripping pressure and part security. The screws of the 4-jaw act directly against the part instead of through the typical scroll common to 3- and 6-jaw chucks.

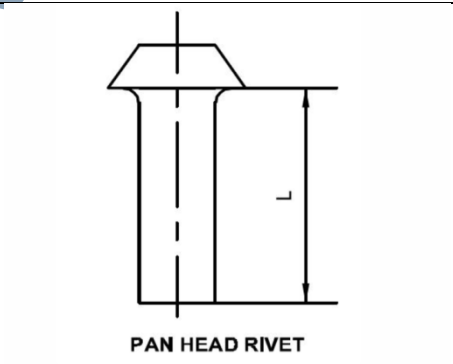
The big disadvantage of the 4-jaw is it's slower for the inexperienced operator to get to the metal-removal part of the job. Thankfully, there is a simple cure. A little bit of practice with the 4-jaw chuck goes a long way toward improving the quality of your lathe work.

tps://www.ctemag.com/news/articles/shop-operations-consider-4-jaw-independent-lathe-chuck

10. The type of rivets used for girders and heavy construction engineering works is

(1) Counter sink head (2) snap head (3) flat head (4) pan head:

Ans:4



https://mytutorialworld.com/objective-questions/single_question_view.php?table_name=fitter_set_1_riveting&uid=1

0&title=Which%20one%20of%20the%20following%20rivets%20is%20used%20for%20girders%20and%20heavy%20constructional%20work%20?

11. In globe valves the pressure is usually

(1) On the left side
(2) against the stem
(3) On the right side
(4) under the seat

Ans: 4

GLOBE VALVES

A Globe valves is a linear motion valve and are primarily designed to stop, start and regulate flow. The disk of a Globe valve can be totally removed from the flowpath or it can completely close the flowpath.

Conventional Globe valves may be used for isolation and throttling services.

FLOW DIRECTION OF GLOBE VALVES

For applications with low temperature, Globe valves are normally installed so that the pressure is under the disc. This contributes an easy operation and helps protect the packing.

For applications with high temperature steam service, Globe valves are installed so that the pressure is above the disk. Otherwise, the stem will contract upon cooling and tend to lift the disk off the seat.

http://www.wermac.org/valves/valves_globe-valves_linear-motion-valve.html

12. The purpose of normalizing is to

(1) Soften the metal
(2) increases the toughness
(3) Refine the structure
(4) harden the surface

Ans:3

In normalizing heat treatment of carbon steel, it is heated to a temperature of 55 °C (131 °F) above the austenitic temperature, Ac3, (Lies between 750-980 °C / 1320-1796 °F) also known as "holding temperature"

https://www.inspection-for-industry.com/normalizing-heat-treatment.html

WHAT IS NORMALISING?

Normalising is a heat treatment process that is used to make a metal more ductile and tough after it has been subjected to thermal or mechanical hardening processes. Normalising involves heating a material to an elevated temperature and then allowing it to cool back to room temperature by exposing it to room temperature air after it is heated. This heating and slow cooling alters the microstructure of the metal which in turn reduces its hardness and increases its ductility.

Why Is Normalising Used?

Normalising is often performed because another process has intentionally or unintentionally decreased ductility and increased hardness. Normalising is used because it causes microstructures to reform into more ductile structures. This is important because it makes the metal more formable, more machinable, and reduces residual stresses in the material that could lead to unexpected failure.

tps://www.metalsupermarkets.co.uk/what-is-normalising/

What Is The Difference Between Annealing and Normalising?

Normalising is very similar to annealing as both involve heating a metal to or above its recrystallisation temperature and allowing it to cool slowly in order to create a microstructure that is relatively ductile. The main difference between annealing and normalising is that annealing allows the material to cool at a controlled rate in a furnace. Normalising allows the material to cool by placing it in a room temperature environment and exposing it to the air in that environment.

This difference means normalising has a faster cooler rate than annealing. The faster cooler rate can cause a material to have slightly less ductility and a slightly higher hardness value than if the material had been annealed. Normalising is also generally less expensive than annealing because it does not require additional furnace time during the cool down process.

The Normalising Process

There are three main stages to a normalising process.

Recovery stage
Recrystallisation stage
Grain growth stage

What Metals Can Be Normalised?

To be normalised, a metal needs to be receptive to normalising, meaning its microstructure can be altered by heat treatment. Many types of alloys can be normalised, including:

Iron based alloys (tool steel, carbon steel, stainless steel, and cast iron)
Nickel-based alloys
Copper
Brass
Aluminium

13. The type of jig in which is base plate is not available is the

(1) Plate jig (2) box jig (3) trunnion jig (4) latch jig

Ans:

14. A sine bar is used for

(1) Leveling the job for drilling (2) finding the angle of a taper job

(3) Measuring the diameter of holes (4) checking the profile of a thread

Ans:2

15. In the pipe assembly, the hemp packing is used

(1) For easy engagement (2) to fill the gap between threads

(3) To avoid leakage (4) to get tight fitting

Ans:3

16. A work piece is centre drilled in the lathe for the purpose of

(1) Turning in between centers only

(2) Spotting a hole for drilling or for turning in between centres

(3) Placing it on a mandrel for turning in between centres

(4) Facing to the centre of the work piece

Ans:2

17. EPROM can be used for:

(1) Erasing the contents of ROM

(2) Reconstructing the contents of ROM

(3) Erasing and reconstructing the contents of ROM

(4) Duplicating ROM

Ans: 3

18. In welding, the causes of slag inclusion are

(1) Current too high (2) using of normal arc

(3) Improper cleaning of base metal (4) incorrect electrode motion

Ans:3 (Slag inclusions result from **faulty welding technique, improper access to the joint, or both**. Sharp notches in joint boundaries or between weld passes promote slag entrapment. With proper technique, slag inclusions rise to the surface of the molten weld-metal.)

19. Clearances are given between bolts an holes in a assemblies for

(1) Trapping burrs, dust etc. (2) lubrication

(3) Minimizing the load on bolt (4) adjusting for slight misalignment

Ans:4

20. The purposes of the holes provided on the sides of the sine bar is to

(1) Prevent distortion (2) clamp the work pieces

(3) Easy handling (4) to minimize surface contact

Ans:2

There are holes drilled across the bar. This **helps in reducing the weight**, and also it facilitates clamping of sine bar on angle plate. The length of the sine bar is the distance between the centres of the rollers.

Sine bar consists of a precisely machined corrosion resistant chrome steel. It is essentially hardened and stabilized. ... The relief holes are drilled into the body of sine bar **to reduce the weight, and to facilitate handling**.

A sine bar is used in conjunction with slip gauge blocks for precise angular measurement. A sine bar is used either to measure an angle very accurately or face locate any work to a given angle. Sine bars are made from a high chromium corrosion resistant steel, and is hardened, precision ground, and stabilized.

Two cylinders of equal diameter are placed at the ends of the bar. The axes of

these two cylinders are mutually parallel to each other, and are also parallel to, and at equal distance from, the upper surface of the sine bar. Accuracy up to 0.01mm/m of length of the sine bar can be obtained.

A sine bar is generally used with slip gauge blocks.

https://openoregon.pressbooks.pub/manufacturingprocesses45/chapter/unit-3-sine-bar/

Sine bar is the one of the most accurate angle measuring device. It uses measuring an angle as well as locating a work-piece in required angle.

Difference between sine bar and protractor : The protractors measure the angle directly, whereas sine bar measures the angle indirectly. Sine bar makes use of the trigonometric function to measure the angle. Sine bar it self not a complete measuring device, it cannot use alone for the measurement of angle. It uses along with auxiliary equipment such as gauge blocks and angle gauge sets. Sine bar has the capability of reducing all angle in terms of right angle.

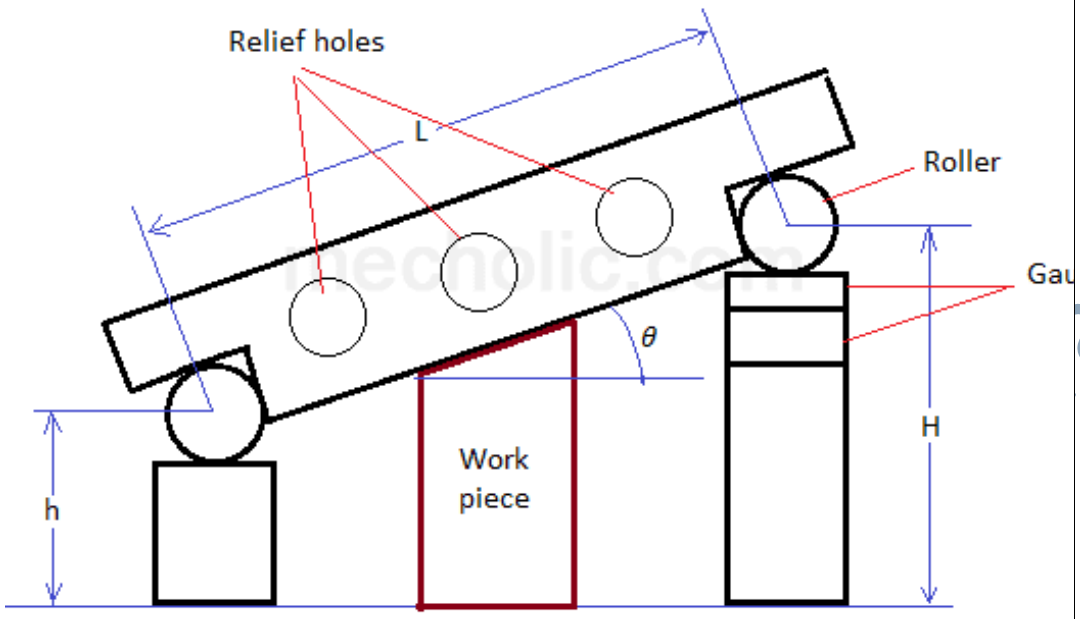
$$sin(angle) = \frac{perpendicular}{hypotenuse}$$

Construction details of sine bar

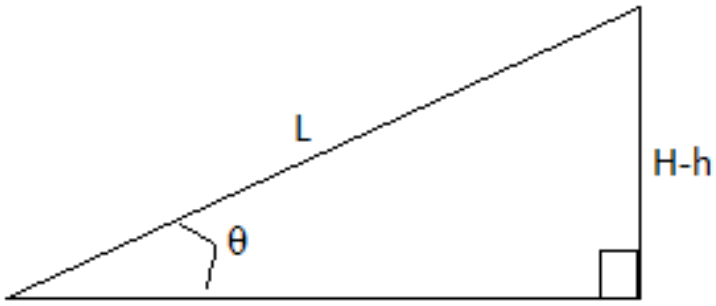
Sine bar consists of a precisely machined corrosion resistant chrome steel. It is essentially hardened and stabilized. It is resting on two identical hardened steel rollers. The distance between the centers of these rollers precisely controlled, this dimension is chosen to be a whole number (200mm, 250mm, 300mm, etc.) for easiness of angle calculation (this dimension becomes the hypotenuse in the calculation).

The relief holes are drilled into the body of sine bar to reduce the weight, and to facilitate handling. Sine bar comes in different lengths, shape or design for the different application, but their principle is same.

Principle of sine bar



The above fig shows the simplest arrangement of sine bar. To measure the angle a wedge is placed on flat surface. Sine bar is positioned on the wedge as shown in fig. Sine bar is supported on the roller on the gauge block. The top surface will incline the same angle as in the wedge. Now the sine of angle is equal to the ratio of the perpendicular distance between the rollers (H-h) to the horizontal distance between roller (length of sine bar, L). This is equivalent to the following figure.



$$sin\,\theta = \frac{H-h}{L}$$

Some other arrangement the object/ workpiece is placed top of the sine bar. Then a dial gauge probe is used to ensure the level of upper surface of workpiece.

21. The process by which steel is heated to a suitable temperature depending upon its carbon content and is held at that temperature for sufficient time, and taken out from the furnace and *kept outside* then slowly cooled to room temperature is known as

(1) Annealing (2) Hardening (3) Normalizing (4) Tempering

Ans:3

21.1The process by which steel is heated to a suitable temperature depending upon its carbon content and is held at that temperature for sufficient time, and kept in the *furnace itself* and slowly cooled to room temperature is known as

(1) Annealing (2) Hardening (3) Normalizing (4) Tempering

Ans:1

22. The current range for a M.S electrode 4 mm diameter is

(1) 60 to 90 amp (2) 130 to 170 amp

(3) 70 to 110 amp (4) 150 t0 250 amp

Ans: 1

23. Visible light region lies

(1) Beyond infra red region

(2) Before ultraviolet region

(3) Between infrared and ultraviolet regions

(4) None

Ans: 3 (VIBGYOR)

24. Pearlite combines the good properties of both ferrite and cementite, and due to this, certain property of steel increases with the carbon content until 0.83% carbon is reached. What is that properly?

(1) Hardness (2) Strength (3) Ductility (4) Malleability

Ans: 2

25. If the main electric supply is not available, one can do arc welding with

(1) Motor generator set (2) transformer set

(3) Engine generator set (4) rectifier set

Ans:

26. In electroplating the metal to be coated is taken as the

(1) Electrolyte (2) cathode (3) anode (4) vessel

Ans: 2

27. The part of the universal surface gauge which helps to draw a parallel line along a datum edge is the

(1)Rocket arm (2) snug

(3) Line adjustment screw (4) guide pins

Ans:4

Universal Surface Gauges
Series AA-141

• The base is made from case hardened steel, ground on the bottom and at one end.

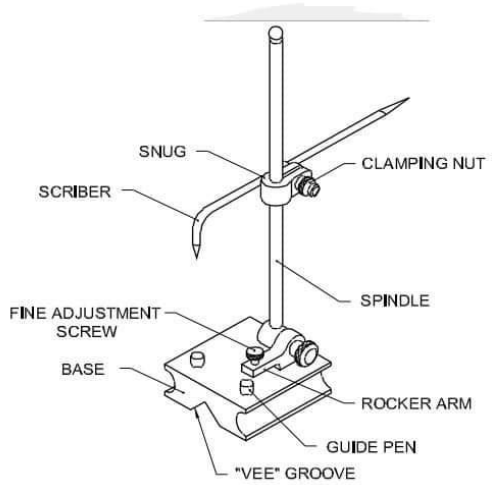
• There is a depression in each side for the thumb and fingers and the groove in the base adapts it for use on cylindrical as well as flat surfaces.

• There are two gauge pins frictionally held, which can be pushed down and used against the end of a surface plate on a T- slot for linear work.

• The fine adjustment feature makes it possible to obtain quick and accurate settings.

• The spindle which passes through rotating head or lower sleeve can be set above or below the base. The hardened and ground scriber can be set at any position on the spindle which in turn can be set at any angle.

tps://www.armatechassociates.com/universal-surface-gauges/



https://www.facebook.com/111521953894589/posts/universal-surface-gauge/120171016363016/

28. The external threads on G.I pipes are cut easily by

(1) Tap sets (2) dies and die stocks

(3) Center lathes (4) thread rollers

Ans:2

29. By using coolant on work pieces we can choose

(1) Higher cutting speeds (2) lower cutting feeds

(3) Lower cutting speeds (4) heavy depth of cuts with low feed

Ans: 1

30. Aluminium is a powerful _____ agent

(1) Oxidizing (reducing (3) transition (4) none of these

Ans:1

31. The most important quality of any cutting fluid is

(1) Emulsification (2) specific heat

(3) Specific gravity (4) viscosity

Ans:2

The desirable properties of cutting fluids in general are 1) High thermal conductivity for cooling 2) Good lubricating qualities 3) High flash point, should not entail a fire hazard 4) Must not produce a gummy or solid precipitate at ordinary working temperatures 5) Be stable against oxidation. 6) Must not promote corrosion or discoloration of the work material. 7) Must afford some corrosion protection to newly formed surfaces. 8) The components of the lubricant must not become rancid easily 9) No unpleasant odour must develop from continued use 10) Must not cause skin irritation or contamination 11) A viscosity that will permit free flow from the work and dripping from the chips.

https://repository.up.ac.za/bitstream/handle/2263/25967/02chapter4.pdf?seque

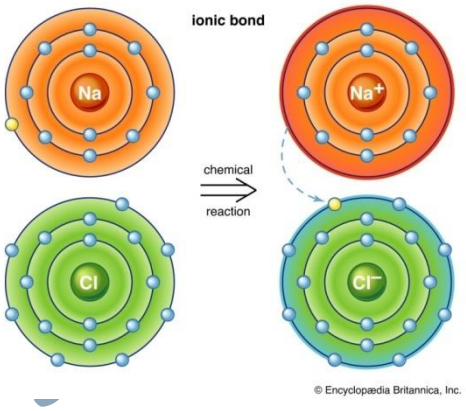
nce=3

32. In complete transfer of electrons from one atom to another _____ bond is formed

(1) Electrovalent (2) covalent (3) ionic (4) Co-ordinate

Ans: 3

Ionic bond, also called **electrovalent bond**, type of linkage formed from the electrostatic attraction between oppositely charged ions in a chemical compound. Such a bond forms when the valence (outermost) electrons of one atom are transferred permanently to another atom. The atom that loses the electrons becomes a positively charged ion (cation), while the one that gains them becomes a negatively charged ion (anion), e.g., sodium chloride. An ionic bond is actually the extreme case of a polar covalent bond, the latter resulting from unequal sharing of electrons rather than complete electron transfer. Ionic bonds typically form when the difference in the electronegativities of the two atoms is great, while covalent bonds form when the electronegativities are similar.



Britannica, The Editors of Encyclopaedia. "ionic bond". ***Encyclopedia Britannica***, 31 Jan. 2020, https://www.britannica.com/science/ionic-bond. Accessed 4 October 2021.

33. Tab washers are used for

(1) Preventing vibration (2) locking the nuts with the object

(3) Self locking (4) fastening work

Ans:2 (Tab Washers are plain washers with one, or a number of tabs which can be bent to provide a mechanical lock between bolt and the object being clamped to. The tab washer prevents rotation of the fastener)

34. Surface plates are used for marking because

(1) They can withstand the weight of heavy components

(2) They have large surface area

(3) Marking tools can slide over easily

(4) They provide the datum surface

Ans: 4

35. In plain bush bearing to prevent the rotation of bush in the housing, it should be fitted by means of

(1) Soldering (2) key or screw (3) brazing (4) welding

Ans:2

36. The purpose of a feeler gauge is to

(1) to measure the gap between 2 mating surfaces

(2) Ensure contact between surfaces without any obstruction

(3) Make for lubrication

(4) adjust the components for play

Ans:1

37. The datum, from which the measurements of a verniar height gauge are taken is

(1) Beam (2) the verniar slide

(3) Base (4) water as coolant

Ans: 3

39. Excessive tool over hang

(1) Causes excessive tool wear

(2) Will result in chatter

(3) Causes overheating of the tool

(4) Will alter the top rake and the front clearance angle of the tool

Ans:2

Tool Overhang is defined as the distance that the tool extends from the end of tool holder (diameter to length ratio). Cutting Forces push the tool away from

the cut causing tool deflection. Cutting forces are produced by the SFM, axial depth of cut, radial depth of cut, feedrate, and material.

By keeping tool overhang to a minimum the following benefits may be achieved

- Reduced Chatter and Vibration
- Increased Tool Life
- Improved part finish
- Increased speed and feed
- Increase in productivity

https://www.destinytool.com/tool-overhang.html

40. In one complete revolution of the bull gear when the ram gets

(1) One reverse stroke (2) one forward and one reverse stroke

(3) One forward stroke (4) none of the three are correct

Ans:2

41. For turning lengthy tapers with a small taper angle, the method of taper turning employed is

(1) Off setting the tail stock

(2) Form tool plunging

(3) Swiveling the compound slide

(4) Combination of the lathe cross slide and the compound slide movement

Ans:1

42. Shaft ends are centre drilled for

(1) Supporting jobs between centers (2) lubricating the dead centre

(3) Reducing the weight (4) assisting counter boring

Ans:1

43. For a body to float in a liquid

(1) Density of the body should be equal to the density of the liquid

(2) Weight of the body should be equal to the weight of the liquid displaced

(3) Weight of the body should be equal to the weight of an equal volume of liquid

(4) Weight of the body should be equal to the volume of the liquid displaced

Ans:2

A body floats in a liquid **when the body's weight is equal to the weight of the liquid displaced**. The density of the body's material is less than or equal to the density of the liquid. When the body floats in neutral equilibrium, the body's weight is equal to the weight of displaced liquid.

https://courses.lumenlearning.com/boundless-physics/chapter/archimedes-principle/

44. The purpose of the rake angle is

(1) To prevent the flank of the tool rubbing with the workpiece

(2) To guide the chips away and avoid clogging

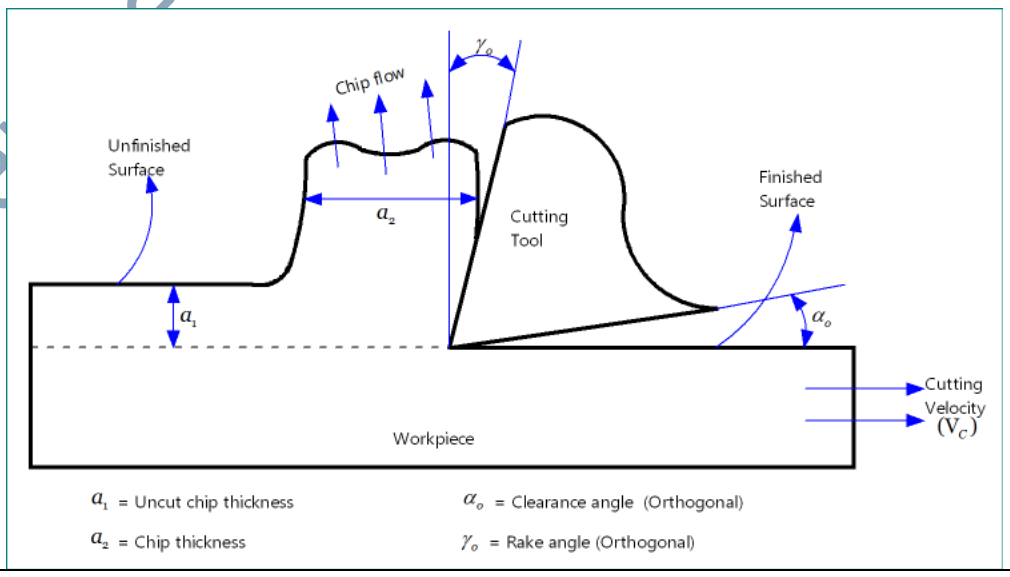
(3) To obtain a good surface finish

(4) To increase the life of the tool

Ans:4

WHAT IS RAKE ANGLE IN CUTTING TOOL?

Geometry, orientation and material of cutting tool are three important factors that influence machining performance and capability. Tool geometry indicates several features of the cutting tool including rake angles, clearance angles, cutting angles and nose radius. Such angles basically determine the inclination of relevant surfaces with respect to other reference surface. As the name suggests, rake angle basically indicates inclination of rake surface of the cutting tool. Since rake surface is the chip flowing surface, so its inclination affects shear deformation, chip thickness, cutting force and power, built-up-edge, etc.



Schematic diagram of conventional machining that depicts rake angle (positive).

DEFINITION OF RAKE ANGLE

It is the angle of orientation of tool's rake surface from the reference plane (π_R) and measured on some other plane. Reference plane (π_R) is a plane which is perpendicular to cutting velocity vector at any point on the cutting tool. Depending on the plane on which it is measured, rake angle may have various names,

Side Rake Angle (γ_X)—It is the angle of orientation of tool's rake surface from the reference plane (π_R) and measured on machine longitudinal plane (π_X). This angle is required for designating an SPTT in ASA system.

http://www.minaprem.com/machining/cutter/geometry/what-is-rake-angle-in-cutting-tool-names-effects-functions-values/

Rake angle is **cutting edge angle** that has a large effect on cutting resistance, chip disposal, cutting temperature and tool life.

RAKE ANGLE

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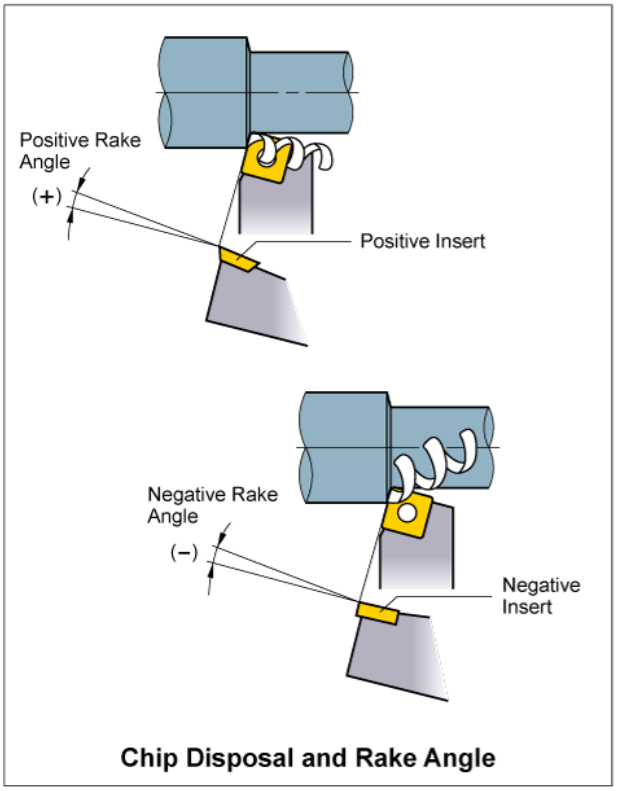


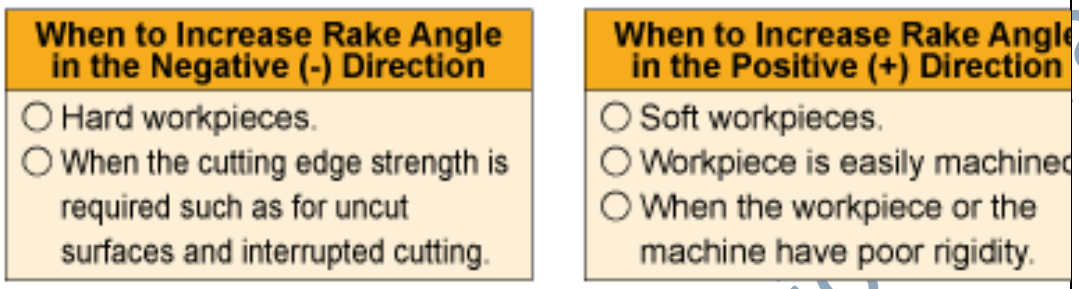
Chip Disposal and Rake Angle

EFFECTS OF RAKE ANGLE

1. Increasing rake angle in the positive (+) direction improves sharpness.

2. Increasing rake angle by 1° in the positive (+) direction decreases cutting power by about 1%.

3. Increasing rake angle in the positive (+) direction lowers cutting edge strength and in the negative (-) direction increases cutting resistance.



http://www.mitsubishicarbide.com/en/technical_information/tec_turning_tools/tec_hsk-t/tec_hsk-t_technical/tec_turning_rake_angle

45. The heat required to convert unit mass of solid into a liquid at the same temperature is known as

(1) Latent heat of the ice (2) latent heat of steam

(3) Latent heat of fusion (4) latent heat of vapourisation

Ans:3

46. A centre gauge is used to

(1) Check the pitch of the thread (2) set the tool at the correct centre height

(3) Check the fit of the thread (4) latent heat of vapourisation

Ans:2

47. The vice clamps are used to

(1) Protect hard jaws (2) clam the work pieces rigidly

(3) Protect the finished surfaces (4) prevent the movable jaw being filled

Ans:3

Vice clamps are used to **hold a finished work using** soft jaws (vice clamps) made of aluminium over the regular jaws. This will protect the work surface from damage

https://www.alibaba.com/product-detail/Bench-vise-clamp-4-5-6_62454427530.html

48. A rough turning tool is used when

(1) Good surface finish is required (2) more stock is to be removed

(3) The spindle speed is very high (4) machining soft material

Ans:2

49. The purpose of the holes provided on the side of the sine bar is to

(1) prevent distortion (2) clamp the work pieces

(3) easy handling (4) to minimize surface contact

Ans: 2

50. A follower steady is held on the

(1) Lathe bed (2) lathe saddle (3) lathe spindle (4) tail stock

Ans:2 (A follower steady is fixed to **the saddle of the lathe**. As it follows the tool it gives support just behind the cutting point. In the follower steady the support is continuous to the entire length of cutting)