S.E. SEM - Ill/ CHOICE BASED / PRODUCTION PROCESS-! / MECH / MAY 2018

1} a) Describe automatic machines? [5M]

Ans:- Automatic Lathe Machines are extremely versatile machines that give big returns on small investment. Up to 80% of all turning jobs can be profitably handled by these automats with accuracy and precision. These automatic machines have proved economical for mass production of simple and complex turned parts for various engineering products. The simple design of these automats greatly reduces the time for changeover of tooling setup from one component to another. We manufacture machines like automatic lathe machines, single spindle automatic lathe, cam lathes, auto capstan lathe machine and bar type automat, with minimum set up and consistent quality can be achieved with minimum investment.

Cabinet - Utilizing MS 16mm steel, which is duly reinforced to prevent vibration and to sustain accuracy.

Spindle - Manufactured from case hardened steel by undergoing forging and is hardened to maintain 5 micron accuracy. These are manufactured utilizing imported bearings and all the threads are grounded in the spindle assembly.

Guide Shafts - We manufacture guide shafts that are hardened, grounded and hard chrome done for extended life.

Vertical Slides & Cross Slides - Our range of vertical slides and slide slides are manufactured from spheroid graphite iron and are precisely machined and scrapped to prevent wear and tear.

Bar feed System - This is weight operated provided for smooth running and preventing noise.

Electrical - All the electrical appliances are of reputed make and free from maintenance

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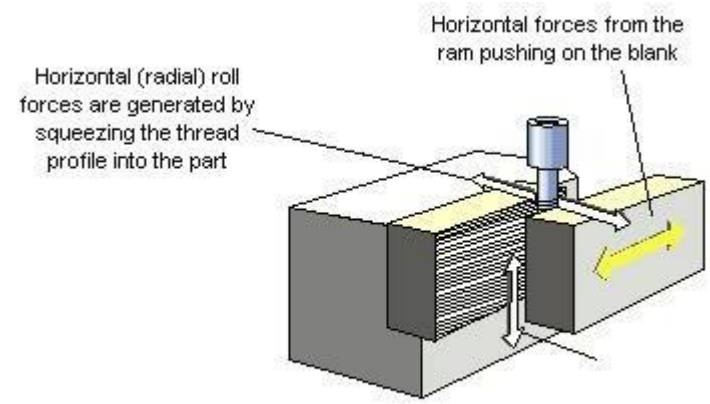
b) What is thread rolling? [5M]

Ans:- thread rolling is an operation which produce external thread by cold forging operation rather than cutting operation. This is achieved by a common thread rolling process, used in industry to manufacture threaded parts, involves forming the threads into the metal of a blank by a pressing and rolling action between two die. The diameter of the blank is equal to pitch of the thread.

The thread rolling is of two types:-

(1) flat dies (2) cylindrical dies

Producing threads by this method has many other benefits over machining the metal. Forming will harden the metal through cold working, does not waste material by cutting, and produces a favorable grain structure to strengthen the part with respect to its function.



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c) How seamless tube are manufactured? [5M]

Ans: - Forging Process to Manufactured Seamless Pipes

In a Forging process, a heated billet is placed in forging die that has a diameter slightly larger than a finished pipe. A hydraulic press of forging hammer with matching inside diameter is used to create cylindrical forging. Once this forging is done pipe is machined to achieve final dimension. Forging is used to manufactured large diameter seamless pipe that cannot be manufactured using traditional methods. Forged pipes are normally used for steam header and pressure vessel shell.

Extrusion Method for Seamless Pipe Manufacturing

In an extrusion method, a heated billet is placed inside the die. A hydraulic ram pushes the billet against the piercing mandrel, material flows from the cylindrical cavity between die and mandrel. This action produces the pipe from the billet. Sometimes pipe manufactured produce pipe with a high thickness which is known as mother hollow. Many secondary pipes manufactured used this mother hollow to produce pipe with different dimensions with help of extrusion process.

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d) Explain explosive welding? [5M]

Ans: - The explosive welding technique has found major use for cladding low cost plate (usually carbon steel) with more expensive corrosion resistant materials. This clad plate is typically used in the chemical and petrochemical industries as tube sheet for heat exchangers.

Explosive welding differs from other traditional joining processes as it does not depend on melting of two metals to be joined, or on plastic deformation of the surfaces in contact as occurs with cold or hot pressure welding. In simple terms an explosive weld is achieved by impelling the cladding plate against the substrate plate material using the considerable energy from an explosive discharge,

resulting in a high energy rate impact. The high interfacial pressure at the point of contact (or collision front) between the cladding plate and the substrate plate must be greater than the yield strength of both materials, to permit plastic deformation within the surface layers to occur. A jet of highly softened metal is formed at the collision front and is projected in front of it as it progresses rapidly across the weld interface. As the jet progresses, it thoroughly cleans the surfaces, thus permitting solid phase bonding to occur between the two materials.

Because bonding occurs in the solid phase, it is possible to weld metals with different melting points and some of the common clad layers deposited onto steel plate are aluminium, copper, bronze, titanium, monel, nickel alloys and zirconium. Alternatively explosive welding can be used to repair or plug tubes in heat exchangers on-site, where conventional welding methods are difficult to use.

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e) Differentiate between arc welding and electron beam welding. [5M]

Ans:-

S.No.	Arc Welding	Electron beam welding
1.	In the arc welding, electricity is used to generate heat.	.in this welding electrons are used to weld two metals
2.	This welding generates stronger joint compare to gas welding.	It gives weaker joint.
3.	It gives poor surface finish.	This welding gives good surface finish.
4.	In arc welding consumable electrode is used.	No electrodes are used
5.	It can be used in welding alone.	It can be used in welding, brazing and soldering.
6.	There is risk of explosion due to high voltage.	There is risk of explosion due to high pressure.
7.	It is mostly used to joint similar material.	It is mostly use to join both similar and different metals.
8.	The heat is concentrate in arc welding.	The heat is distributing according to the beam. There is higher loss of energy.
9.	It is more efficient.	It is less efficient.
10.	Speed of welding is high.	Speed of welding is low.
11.	The initial cost of arc welding is high.	The setup cost of gas welding is low

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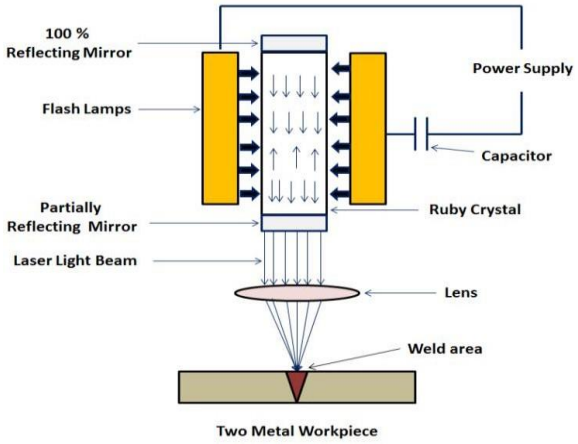
Q2} a) with a neat sketch explain the principle and working of laser beam welding. [08] Also discuss its advantages, limitations and application.

Ans: - Principle - It works on the principle that when electrons of an atom gets excited by absorbing some energy. And then after some time when it returns back to its ground state, it emits a photon of

light. The concentration of this emitted photon increased by stimulated emission of radiation and we get a high energy concentrated laser beam.



- First the setup of welding machine at the desired location (in between the two metal pieces to be joined) is done.
- After setup, a high voltage power supply is applied on the laser machine. This starts the flash lamps of the machine and it emits light photons. The energy of the light photon is absorbed by the atoms of ruby crystal and electrons get excited to their higher energy level. When they return back to their ground state (lower Energy state) they emit a photon of light. This light photon again stimulates the excited electrons of the atom and produces two photons. This process keeps continue and we get a concentrated laser beam.
- This high concentrated laser beam is focused to the desired location for the welding of the multiple pieces together. Lens are used to focus the laser to the area where welding is needed. CAM is used to control the motion of the laser and workpiece table during the welding process.
- As the laser beam strikes the cavity between the two metal pieces to be joined, it melts the base metal from both the pieces and fuses them together. After solidification we get a strong weld.
- This is how a laser Beam Welding Works.

ADVANTAGES :-

- It produces high weld quality.
- No electrode is required.
- No tool wears because it is a non-contact process.
- The time taken for welding thick section is reduced.
- It has the ability to weld metals with dissimilar physical properties.
- It can be weld through air and no vacuum is required.

LIMITATION:-

- Initial cost is high.
- High maintenance cost.
- Due to rapid rate of cooling, cracks may be produced in some metals.
- High skilled labour is required to operate LBW.
- The welding thickness is limited to 19 mm.
- The energy conversion efficiency in LBW is very low. It is usually below 10 %.

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b) Differentiate between the open loop and close loop system. [06]

Ans:-

Open Loop System	Closed Loop System
The system whose control action is free from the output is known as the open loop control system.	In closed loop, the output depends on the control action of the system.
Components are controller and controlled Process.	Amplifier, Controller, Controlled Process, Feedback.
Construction is simple	Construction is complex
Non-reliable	Reliable
Stable	Less Stable
Fast process	Slow process
Non-linear	Linear
Example Traffic light, automatic washing machine, immersion rod, TV remote etc.	Example Air conditioner, temperature control system, speed and pressure control system, refrigerator, toaster.

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c) Explain gas cutting operation. [6M]

Ans:- Oxy-fuel cutting is a thermal cutting process that uses oxygen and fuel gas (such as acetylene, propane, MAPP, propylene and natural gas) to cut through materials.

The oxy fuel process is the most widely applied industrial thermal cutting process because it can cut thicknesses from 0.5mm to 250mm, the equipment is low cost and can be used manually or mechanized. There are several fuel gas and nozzle design options that can significantly enhance performance in terms of cut quality and cutting speed.

The cutting process is basically, a mixture of oxygen and the fuel gas is used to preheat the metal to its 'ignition' temperature which, for steel, is 700°C - 900°C (bright red heat) but well below its melting point. A jet of pure oxygen is then directed into the preheated area instigating a vigorous exothermic chemical reaction between the oxygen and the metal to form iron oxide or slag. The oxygen jet blows away the slag enabling the jet to pierce through the material and continue to cut through the material.

There are four basic requirements for oxy-fuel cutting:

- the ignition temperature of the material must be lower than its melting point otherwise the material would melt and flow away before cutting could take place
- the oxide melting point must be lower than that of the surrounding material so that it can be mechanically blown away by the oxygen jet

- the oxidation reaction between the oxygen jet and the metal must be sufficient to maintain the ignition temperature
- a minimum of gaseous reaction products should be produced so as not to dilute the cutting oxygen

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Q3 a. Compare thermoplastics and thermosetting plastics. [08]

Ans:-

Thermosetting Plastic	Thermoplastic
Thermosetting plastic are known for their high molecular weight.	If you consider the thermoplastics then, they have a low molecular weight.
A process of condensation polymerization is used in the making of the thermosetting plastic.	A process of addition polymerization is used in the making of the thermoplastics.
Thermosets have a brittle nature.	If you consider the thermoplastics then, they have flexible nature.
They have the capability of not dissolving in the solvents that are organic	They are capable of dissolving in the organic solvents.
As they are hard and not flexible, they are not easy to recycle.	Thermoplastics can be easily recycled.
Bakelite, Epoxy Resin, Polyurethanes, Polyester Resins, Urea-formaldehyde are the examples of the thermosetting plastics.	Nylon, Acrylic, Teflon, Polyvinyl Chloride, Polyethylene are the examples of the Thermoplastic.
They are more durable.	Thermoplastics are less durable.
They are economical as they have low cost.	Due to the slightly higher cost than the thermosetting plastic, they are less economical.
Thermally, thermosetting plastic are more stable.	Thermally, thermoplastics are less stable.
Reaction injection moulding, compression moulding are used to process the thermosetting plastic.	They are easier to process with the rotational moulding, injection moulding, extrusion process, etc.

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b. Describe the desirable properties of moulding sand [6]

Ans: - A moulding sand should possess the following 6 properties

1. **Porosity**- Porosity is also called as permeability. It is the ability of sand by which it allows the gases to pass through it easily. Some gases gets dissolved in molten metal and when this molten metal starts to solidify, these dissolved gases comes out of the molten metal and try to escape out of

the moulding sand. If the sand is not enough porous than these gases will not be able to go out of the mould and gets trapped into the casting and produces holes and pores in metal casting.

2. **Flowability** - The ability of moulding sand to behave like a fluid when it is rammed is called flowability.Due to this property the sand can easily occupy the space in molding box and take up its shape. This allows the sand to compress to a compact density and let it pack around the pattern. The sand should be of high flowability, so that it can be easily compacted for uniform density and to obtain a good impression of the pattern in the mould. The flowability of the sand can be increases as we increases the clay and water content in the sand.

3. **Collapsibility** - The ability of the moulding sand to collapse after solidification of the molten metal is called collapsibility. After the solidification of molten metal, the sand should get collapse for free contraction of the metal. If free contraction of the metal will happen than if eliminates naturally the tearing or cracking of the contracting metal.

4. **Adhesiveness** - The ability of the sand particles to get stick with another body is called adhesiveness. The sand should have sufficient adhesiveness so that it can easily get cling to the sides of the moulding boxes and does not fall out to the box when it is removed.

5. **Cohesiveness or strength** - The ability of the sand particles to stick with each other is called cohesiveness. The strength of the sand depends upon how cohesive the sand particles are. Thesand should have sufficient strength so that it can easily capable to retain its shape during conveying, turning or closing and pouring. If it is not of appropriate strength than it will not be able to hold its shape and the mould may damage during pouring of molten metal. Low strength sand leads to pouring casting defects in metals. To avoid pouring defects, the sand should be of sufficient strength to produce mold of desired shape and also retain this shaped even when the molten metal is poured in the moulding cavity.

The sand strength can be of two types

(i) **Green strengt**h: The strength of sand possessed by it in its green or moist state is called green strength. The mould with adequate green strength retains its shape and do not collapse even when the pattern is removed from the moulding box.

(ii) **Dry strength**: The strength possessed by the sand in its dry or baked state is called dry strength. Enough dry strength allows the sand to withstand erosive forces due to molten metal and helps to retain its shape.

6. **Refractoriness** - The ability of the moulding sand to withstand the high temperature of the molten metal without fusing into it is called refractoriness. The moulding sand must have enough refractoriness property to produce excellent quality of casting free from defects. The sand with lack of refractoriness melts and gets fuse in the casting and spoils the quality of the cast metal. The refractoriness is the measure of sinter point of the sand not its melting point

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c. What are transfer machines? [6]

Ans: - Transfer machines are metal working machine tools with several stations for performing various machining processes. Workpieces are fed into the machine and automatically indexed from station to station. Each station simultaneously performs a different operation on the workpiece and they exit the machine as a partially or completely finished unit. Standard transfer machine systems consist of multiple, sequential mechanical components, such as machining heads, transfer devices, indexing tables, and work. Workpieces are held by stationary or traveling fixtures and indexed in a circular or linear path. In the course of a cycle, components pass through each work station undergoing specific machining operations. The indexing table turns either vertically or horizontally and supports both continuous and intermittent movement. When combined with an automated transfer line for part feeding, transfer machines amplify production rate.

Transfer machines come in three main types, namely

Rotary: These machines move workpiece between stations in a circular path. Mass manufacturing within a small footprint makes these systems an economical solution. Modern CNC-enabled flexible transfer machines of this type gained popularity in European and North American domestic manufacturing facilities given the lower labor costs.

In-line or linear: Workpieces follow a linear path from one workstation to the other. The number of axes a machine operates on, combined with the number of machining stations, determines the quantity and type of parts and processes the machine can perform.

Q4. a. Describe types of drilling machines and there application. [8]

Ans: - Drilling machines or drill presses are one of the most common machines found in the machine shop. A drill press is a machine that turns and advances a rotary tool into a workpiece. The drill press is used primarily for drilling holes, but when used with the proper tooling, it can be used for a number of machining operations. The most common machining operations performed on a drill press are drilling, reaming, tapping, counter boring, countersinking, and spot facing.

There are many different types or configurations of drilling machines, but most drilling machines will fall into four broad categories: upright sensitive, upright, radial.

UPRIGHT SENSITIVE DRILL PRESS: The upright sensitive drill press is a light-duty type of drilling machine that normally incorporates a belt drive spindle head. This machine is generally used for moderate-to-light duty work. The upright sensitive drill press gets its name due to the fact that the machine can only be hand fed. Hand feeding the tool into the workpiece allows the operator to "feel" the cutting action of the tool. The sensitive drill press is manufactured in a floor style or a bench style.

UPRIGHT DRILL PRESS: The upright drill press is a heavy duty type of drilling machine normally incorporating a geared drive spindle head. This type of drilling machine is used on large hole-producing operations that typically involve larger or heavier parts. The upright drill press allows the operator to hand feed or power feed the tool into the workpiece. The power feed mechanism automatically advances the tool into the workpiece. Some types of upright drill presses are also manufactured with automatic table-raising mechanisms

RADIAL ARM DRILL PRESS: The radial arm drill press is the hole producing work horse of the machine shop. The press is commonly referred to as a radial drill press. The radial arm drill press allows the operator to position the spindle directly over the workpiece rather than move the workpiece to the tool. The design of the radial drill press gives it a great deal of versatility, especially on partstoo large to position easily. Radial drills offer power feed on the spindle, as well as an automatic mechanism to raise or lower the radial arm. The wheel head, which is located on the radial arm, can also be traversed along the arm, giving the machine added ease of use as well as versatility. Radial arm drill presses can be equipped with a turn on table or tilting table. This gives the operator the ability to drill intersecting or angular holes in one setup.

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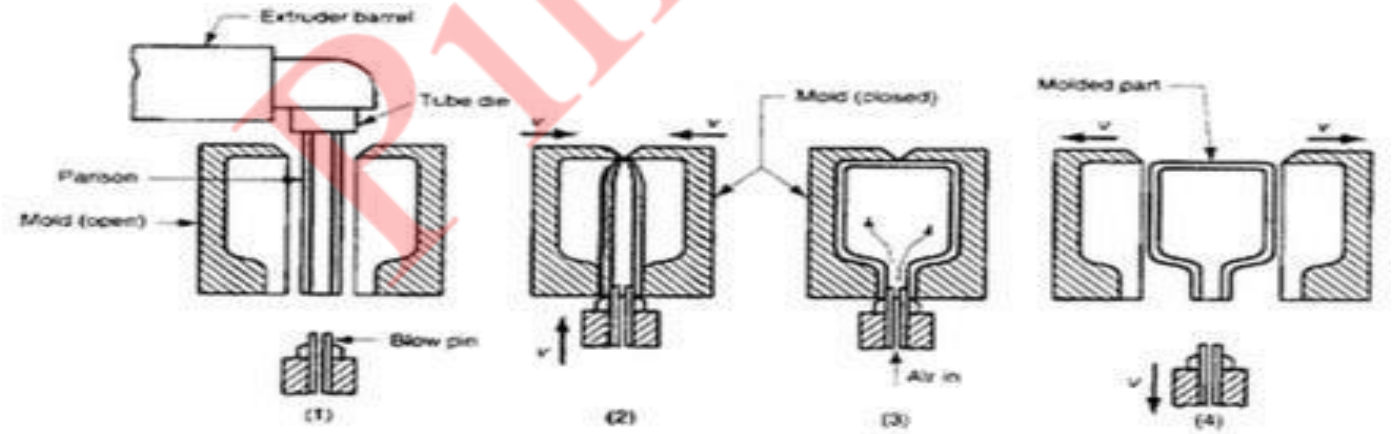
b. Explain blow moulding process with a neat sketch. [06]

Ans: - Blow molding is a manufacturing process that is used to produce hollow plastic parts by inflating a heated plastic until it fills a mold and formed the desired shape.

In this process, the thermoplastic in the form of small pellets or granules is first heated above the melting temperature and molded into a preform using injection molding process. These preforms are used to feed into the blow mold. The preform is heated above the glass transition temperature and formed into a hollow tube which is called parison.

The parison is then clamped between two mold halves and inflated by high air pressure until it conforms to the inner shape of the mold. The air pressure is required as 60 to 140 psi depending upon the material used. The preform is always stretched from the center of the part during the process. This is a single stage process, as both preform manufacturing and bottleblowing are performed in the same machine. The formed part solidified as it is cooled inside the mold. The mold halves are separated and the final product is removed. Final part may be trimmed**.**



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c. What is riser? Discuss its types and application. [06]

Ans: - A riser is a hole cut or moulded in the cope to permit the molten metal to rise above the highest point in the casting. The riser serves a number of useful purposes. It enables the pourer to

see the metal as it falls into the mould cavity. If the metal does not appear in the riser, it signifies that either the metal is insufficient to fill the mould cavity or there is some obstruction to the metal flow between the sprue and riser.

The riser facilitates ejection of the steam, gas, and air from the mould cavity as the mould is filled with the molten metal. Most important, the riser serves as a feeder to feed the molten metal into the main casting to compensate for its shrinkage. The use of several risers may be necessary in the case of an intricate or large casting with thin sections. The main requisites of an effective riser are the following:

1. It must have sufficient volume as it should be the last part of the casting to freeze.

2. It must completely cover the sectional thickness that requires feeding.

3. The fluidity of the molten metal must be adequately maintained so that the metal can penetrate the portions of the mould cavity freezing towards the end.

Risers may be classified as open risers and blind risers. In the open riser, the upper surface is open to the atmosphere and the riser is usually placed on the top of the casting or at the parting plane. The open riser seldom extends downwards into the drag, i.e., below the parting plane. This riser, therefore, derives feeding pressure from the atmosphere and from the force of gravity on the metal contained in the riser. In case a certain thickness of metal solidifies in the upper part of the riser, atmospheric pressure no longer remains effective, rendering metal flow from the riser to the casting difficult. The blind riser, on the other hand, is surrounded by moulding sand on all sides and is in the form of around cavity in the mould placed at the side or top of the casting. It may be located either in the cope or in the drag. Since this riser is closed from all sides, atmospheric pressure is completely shut out. The pressure due to the force of gravity is also reduced due to the formation of vacuum within its body.

Q5. a. Discuss various defects found in welding. [08]

Ans: - Welding Defects can be defined as the irregularities formed in the given weld metal due to incorrect or welding methods. Welding defects may be occur either outside or inside the weld metal.

Welding defects can be classified into two types as external and internal defects, named below

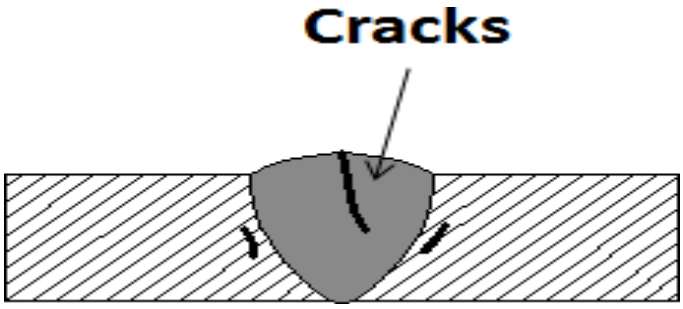
1) Weld crack
2) Undercut
3) Spatter
4) Porosity
5) Overlap

Explanation:

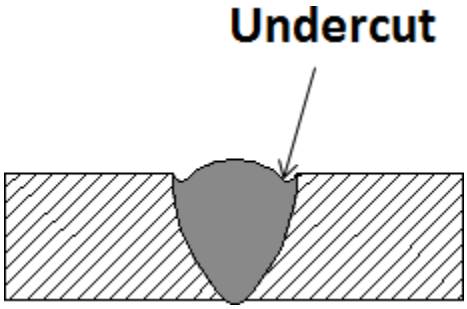
1) Weld crack: - Welding cracks can be present on the surface, or inside of the weld material or at the heat affected zones. It is divided into two parts

a) Hot welding:- It is more prominent during crystallization of weld joints where the temperature can rise more than 10,000-degree Celsius.

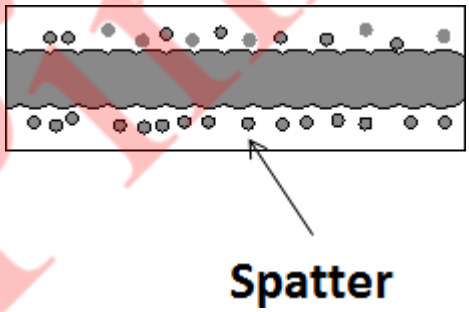
b) Cold crack:- This type of crack occurs at the end of the welding process where the temperature is quite low. Sometimes cold crack is visible several hours after welding or even after few days.



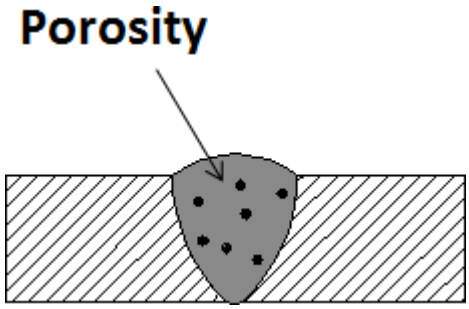
2) Undercut: - When the base of metal melts away from the weld zone, then a groove is formed in the shape of a notch, then this type of defect is known as Undercut. It reduces the fatigue strength of



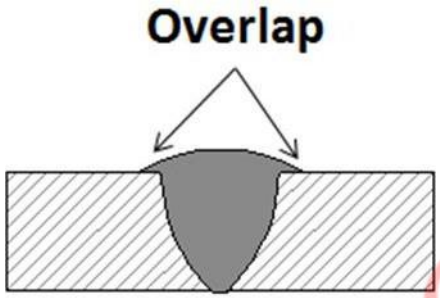
3) Spatter**: -** When some metal drops are expelled from the weld and remain stuck to the surface, then this defect is known as Spatter.



4) Porosity**: -** Porosity in the condition in which the gas or small bubbles gets trapped in the welded zone.



5) Overlap**: -** When the weld face extends beyond the weld toe, then this defect occurs. In this condition the weld metal rolls and forms an angle less than 90 degrees.



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b. Define weldability and describe the factors affecting it. [06]

Ans:-

The ease with which welding of a given material can be done without producing any defect is called Weldability. It can also be defined as the capability of metal to be welded under the fabrication conditions imposed satisfactorily on the intended surface. The metal should not require expensive or complicated or extracting procedures to produce a sound joint.

Factors affecting Weldability:

Melting point, thermal conductivity, reactivity, the coefficient of thermal expansion, electrical resistance and surface condition of material are the factor that affects weldability.

Melting point of metal: Materials with a medium melting point can be welded very easily.

Thermal conductivity: Material with high thermal conductivity (K) are treated as difficult to weld materials.

Reactivity: If the material reacts with air, water or surroundings it becomes difficult to weld.

The coefficient of thermal expansion of metals: Material with high thermal expansion coefficient, it becomes difficult to weld.

Electrical resistance: Higher the electrical resistance of the material, it becomes difficult because it requires a lot of heat energy.

Surface condition: The material with the dirty surface it becomes difficult to weld.

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c. Differentiate between hot working and cold working processes. [06]

Ans:-

S.No.	Cold working	Hot working
1	It is done at a temperature below the recrystallization temperature.	Hot working is done at a temperature above recrystallization temperature.
2	Cold working decreases mechanical properties of metal like elongation, reduction of area and impact values.	It increases mechanical properties.
3	Crystallization does not take place.	Crystallization takes place.
. 4	Material is not uniform after this working.	Material is uniform thought.
5	There is more risk of cracks.	There is less risk of cracks.
6	Internal and residual stresses are produced.	Internal and residual stresses are not produced.
. 7	Cold working required more energy for plastic deformation.	It requires less energy for plastic deformation because at higher temperature metal become more ductile and soft.
. 8	It does not require pickling because no oxidation of metal takes place.	Heavy oxidation occurs during hot working so pickling is required to remove oxide.
9.	Embrittlement does not occur in cold working due to no reaction with oxygen at lower temperature.	There is chance of Embrittlement by oxygen in hot working hence metal working is done at inert atmosphere for reactive metal

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Q6. a. What are the constituents of moulding sand? Discuss their function. [08]

Ans: - A large variety of molding materials is used in foundries for manufacturing molds and cores. They include molding sand, system sand or backing sand, facing sand, parting sand, and core sand. The choice of molding materials is based on their processing properties. The properties that are generally required in molding materials are:

Refractoriness

It is the ability of the molding material to resist the temperature of the liquid metal to be poured so that it does not get fused with the metal. The refractoriness of the silica sand is highest.

Permeability

During pouring and subsequent solidification of a casting, a large amount of gases and steam is generated. These gases are those that have been absorbed by the metal during melting, air absorbed from the atmosphere and the steam generated by the molding and core sand. If these gases are not allowed to escape from the mold, they would be entrapped inside the casting and cause casting defects. To overcome this problem the molding material must be porous. Proper venting of the mold also helps in escaping the gases that are generated inside the mold cavity.

Green Strength

The molding sand that contains moisture is termed as green sand. The green sand particles must have the ability to cling to each other to impart sufficient strength to the mold. The green sand must have enough strength so that the constructed mold retains its shape.

Dry Strength

When the molten metal is poured in the mold, the sand around the mold cavity is quickly converted into dry sand as the moisture in the sand evaporates due to the heat of the molten metal. At this stage the molding sand must possess the sufficient strength to retain the exact shape of the mold cavity and at the same time it must be able to withstand the metallo static pressure of the liquid material.

Hot Strength

As soon as the moisture is eliminated, the sand would reach at a high temperature when the metal in the mold is still in liquid state. The strength of the sand that is required to hold the shape of the cavity is called hot strength.

Collapsibility

The molding sand should also have collapsibility so that during the contraction of the solidified casting it does not provide any resistance, which may result in cracks in the castings. Besides these specific properties the molding material should be cheap, reusable and should have good thermal conductivity.

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b. Describe machining the operations performed on lathe machine. [06]

Ans: - Lathe is a machine that helps in shaping several material pieces in the desired shapes. A lathe is a machine that rotates the piece on the axis in order to perform various operations like cutting, facing, knurling, deformation and more. The wood piece is placed in between the headstock and the tailstock of the lathe. Clamping is also used to work the piece about the axis of rotation with the help of a faceplate, clamps/dogs or collet/chuck. The products produced with the help of the lathe machine are cue sticks, musical instruments, candlestick holders, table legs, baseball bats, gun barrels, camshafts, bowls, crankshafts and much more. There are plenty of lathe that vary in sizes and shapes according to the work to be done.

Types of Lathe Operation:-

The working of the lathe machine changes with every operation and cut desired. There are a lot of operations used for using the lathe machine. Some of the common lathe operations are:

Facing

This is usually the first step of any lathe operation on the lathe machine. The metal is cut from the end to make it fit in the right angle of the axis and remove the marks.

Tapering

Tapering is to cut the metal to nearly a cone shape with the help of the compound slide. This is something in between the parallel turning and facing off. If one is willing to change the angle then they can adjust the compound slide as they like.

Parallel Turning

This operation is adopted in order to cut the metal parallel to the axis. Parallel turning is done to decrease the diameter of the metal.

Parting

The part is removed so that it faces the ends. For this the parting tool is involved in slowly to make perform the operation. For to make the cut deeper the parting tool is pulled out and transferred to the side for the cut and to prevent the tool from breaking.

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c. Define the terms 'Spread', . 'Elongation' and 'Draft' with respect to rolling process. [06]
Ans:-

Spread refers to the increase in width of rolled strips of low width to thickness ratios – square sectioned strips for example. Reducing the friction, increasing the roll radius to strip thickness ratio and using wider strips can reduce the roll spread.
Spread is dependent upon the several factors

1. Draft
2. Roll diameter
3. Stock temperature roll material
4. And the material being rolled

Draft :- Draft is the difference between the starting thickness and the final thickness as the workpiece passes between the two opposing rolls. Absolute draft is expressed in linear units and is the difference between the entry height and exit height of the stock.

Elongation :- Elongation is the increase in length of the stock due to the reduction in area. Elongation usually defines the total elongation from billet to product, or in a specific section of the mill, for example the roughing mill or finishing block.