WORKSHOP TECHNOLOGY 2015 - NECTA FORM FOUR

Solutions from: Maktaba by TETEA

By Yohana Lazaro

1.

i	ii	iii	iv	v	vi	vii	viii	ix	x
A	E	B	E	B	D	E	C	D	C

2.functions of cutting fluids

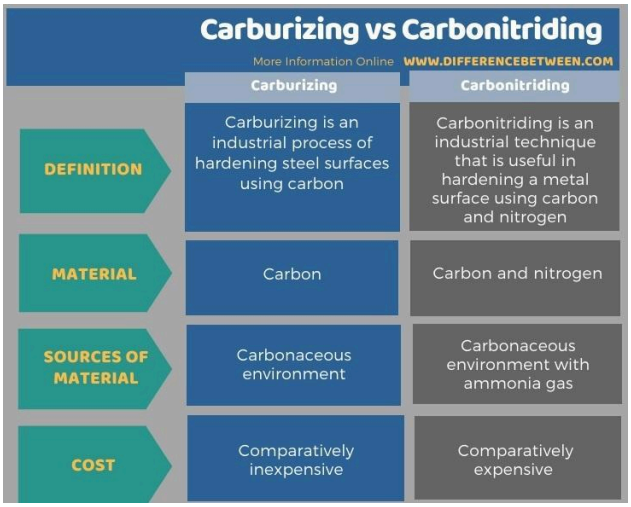
-remove away cut chips

-lubricate the cutting edges

-good finished surface

-cooling effect

3.



4.(a)it becomes soft

(b)it's hardness is increased.i.e hardened.

5.Methods use to identify metals

-by sound test

-by spark test on grinding machine

- by using the colour codes.

6.(a)Gun metal

(b,) phosphine bronze

(c) Aluminum bronze

7.(a)Limits are the extreme permissible values of a dimension.

(b)Fits is the degree of tightness or looseness between two mating parts that are intended to act together.

(c)Accuracy is the measure of degree closeness between the measured value and actual value.

8.(a)Lead

(b)Brass

(c)copper

9.

Difference b/w Tolerance and Allowance

Tolerance	Allowance
It is the permissible variation in dimension of a part(hole or shaft).	It is the prescribed difference b/w the dimensions of two mating parts(hole and shaft).
It is the difference b/w lower and higher limits of a dimension of a part.	It is intentional difference b/w the lower limit of hole and higher limit of shaft.
Tolerance is to be provided on a dimension of part as it is not possible to make a part of exact specified dimension.	Allowance is to be provided on the dimension of mating parts to obtain required type of fit.
It has an absolute value without sign.	Allowance may be positive(clearance) or negative(interference).

10.Properties of grease as a lubricant.

No.	Properties	Description
1	Correct and proper viscosity	Lubricant should maintain proper viscosity to form a stable oil film at the specified temperature and speed of operation.
2	Antiscoring property	Lubricant should have the property to prevent the scoring failure of tooth surface while under high-pressure of load.
3	Oxidization and heat stability	A good lubricant should not oxidize easily and must perform in moist and high-temperature environment for long duration.
4	Water antiaffinity property	Moisture tends to condense due to temperature change when the gears are stopped. The lubricant should have the property of isolating moisture and water from lubricant
5	Antifoam property	If the lubricant foams under agitation, it will not provide a good oil film. Antifoam property is a vital requirement.
6	Anticorrosion property	Lubrication should be neutral and stable to prevent corrosion from rust that may mix into the oil.

11.-has a good thermal conductivity

-it has a higher tensile strength

-can resist corrosion

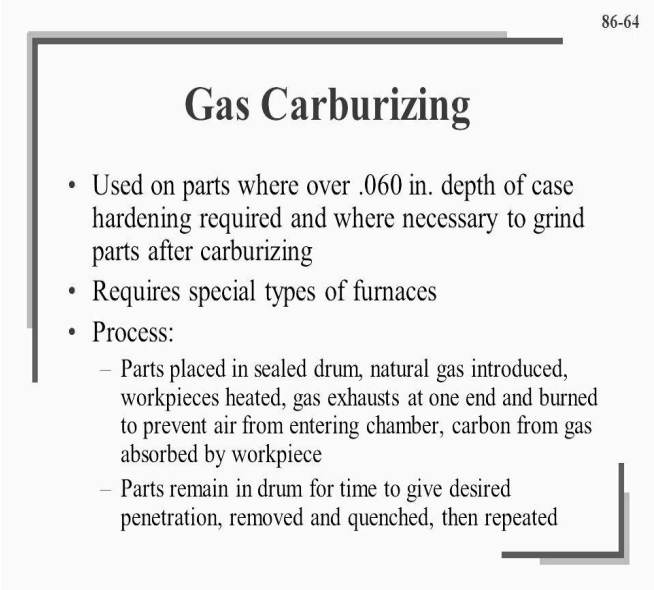
it is not too tough.

12.(a)(i)

LIQUID CARBURIZING

- Liquid carburizing is a method of case hardening steel by placing it in a bath of molten cyanide so that carbon will diffuse from the bath in to the metal and produce a case comparable to the one resulting from pack or gas carburizing.
- Liquid carburizing may be distinguished from cyaniding by the character and composition of the case produced. The cyanide case is higher in nitrogen and lower in carbon the reverse is true of liquid carburized cases.
- Low temperature salt baths (lights case) usually contain a cyanide content of 20 percent and operate between 1550 °F and 1650° F.
- High temperature salt baths (deep case) usually have cyanide content of 10 percent and operate between 1650°F and 1750° F.

(ii)



(b) The purpose of tempering is to reduce brittleness of the hardened steel.

(c)-thickness of a metal

-cross section area of the body.

-air resistance

-amount of metals available.

(d)-martensite changes to fully ferrite,and the cementite changes to spherodized.

-it relieve internal stress and reduce brittleness.

13.(a)(i) upper limit = 40 +0.39. = 40.39mm

Lower limit =40 + 0= 40mm

(ii)upper limit = 40 - 25 = 15mm

Lower limit = 40 - 50 = -10 mm

(iii) Tolerance of hole = 40.39-40= 0.39mm

Tolerance of shaft =15+10=25mm

(iv) class of fit is transition fit.

(b)-unilateral tolerance

-bilateral tolerance.

(c)(i) for hole,upper limit is 40.04mm

Lower limit is 40.00mm

(ii)for a shaft,upper limit is 39.98mm

Lower limit= 39.95mm

(iii)Hole tolerance = 40.04-40.00=0.04mm

(iv)shaft tolerance = 39.98-39.95=0.03mm

(v)max.clearance = 40.04-39.98= 0.06mm

(vi)min.clearance=40.00-39.95=0.05mm

14(a)-silicon

-sulphur

-manganese

-phosphorus

(b)-increased strength

-increased hardness

-increased toughness

-increased wear resistance

-corrosion resistance

(c)-low carbon steel 0.04%-0.3%

-medium carbon steel 0.4%-0.6%

-high carbon steel 0.7% -1.65%

(d)(i)Casting is the process it pouring molten metal into moulds of different shapes.

(ii)Rolling of metal is the process of passing a metal through a gap between rollers rotating in opposite direction.

(e)(i)types of iron ore.

-hematite

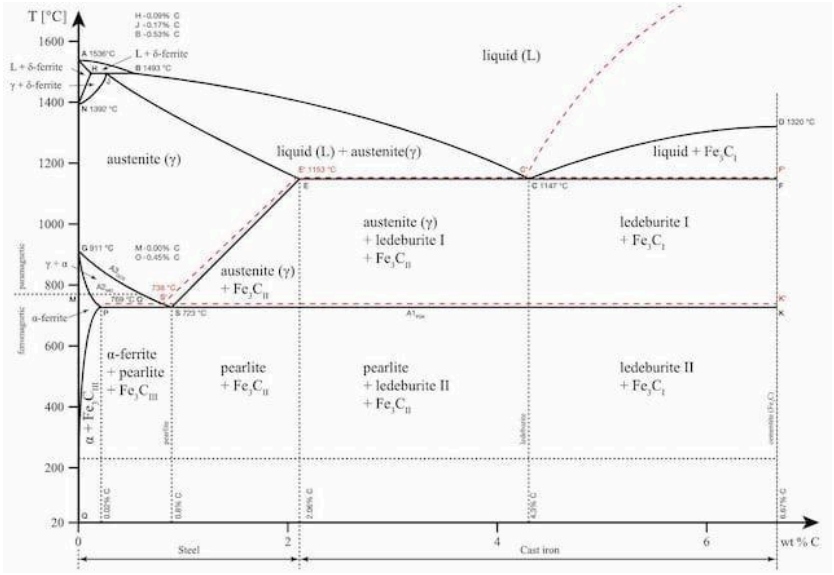
-taconite

G -limonite

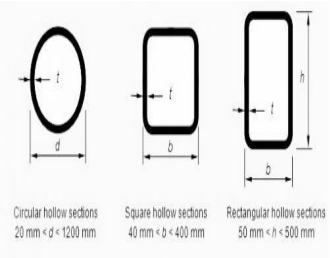
(ii)-underground mining

-open crust mining

15.



16.(a)(i)Forms of hollow steel sections



(ii)-chasis construction

-used in bridge constructions

-as building material supply.

(b)(i)-rough finished work.

-finished surface can be corroded easily

-it can make easy for a cutting edge to wear out.

(ii)methods used to supply lubricants to machine are:-

-Gravity method

-Splash method

-pump method

Prepare by:-

YOHANA PETER LAZARO

0624876331,0756274618, mchelezdo2@gmail.com