Some Innovations

Models and Charts

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY,
MANAGEMENT & GRAMOTHAN, JAIPUR
DEPARTMENT OF MECHANICAL ENGINEERING
DESIGN OF MACHINE ELEMENTS-1

TYPES OF RADIAL ROLLER BEARING:

NAME	DIAGRAM	APPLICATIONS
1. CYLINDER ROLLER BEARING		LARGE AND MEDIUM SIZE MOTORS , TRACTION MOTORS, GENERATORS, INTERNAL COMBUSTION ENGINES, GAS TURBINES, SPEED REDUCERS, CARGO TRANSPORT EQUIPMENTS, INDUSTRISAL EQUIPMENTS
2. NEEDLE ROLLER BEARING		COMMON APPLICATIONS: U JOINTS, PLANETARY GEARS, CONSTANT MESH GEARS
3. TAPERED ROLLER BEARING		AUTOMOBILES: FRONT AND REAR WHEEL, TRANSMISSIONS, DIFFRENTIAL PINION OTHERS: MACHINE TOOL SPINDLES, CONSTUCTION EQUIPMENTS , ROLLING MILL ROLL NECKS AND SPED REDUCERS

SUBMITTED BY:
ANAND KUMAR (A-11) ANKUR MITTAL (A-14) ANSHUL NAHAR (A-17)
ANIRUDDH SINGHL (A-12) ANKUR YADAV (A-15) ANUJ MITTAL (A-18)
ANKIT AGARWAL (A-13) ANSHUL MAHESHWARI (A-16) ANOOP BHARADIA (A-19) (DEPARTMENT OF MECHANICAL ENGG.)

SUBMITTED TO:
MR. VINAY SINGH MARWAL
READER

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY,
MANAGEMENT & GRAMOTHAN, JAIPUR
DEPARTMENT OF MECHANICAL ENGINEERING
DESIGN OF MACHINE ELEMENTS-1

TYPES OF THRUST BEARINGS:

NAME	DIAGRAM	APPLICATIONS
1. THRUST BALL BEARING		AUTOMOBILE KINGS PIN, MACHINE TOOL SPINDLE
2. CYLINDRICAL ROLLER THRUST BEARING		HYDRO ELECTRIC GENERATORS, VERTICAL MOTORS, PROPELLER SHAFTS, SCREW DOWN SPEED REDUCERS, COAL MILLS, PUSHING MACHINES, MOLDING MACHINES
3. SPHERICAL THRUST ROLLER BEARING		COMBINATION OF SHAFT AND HOUSING WASHERS

SUBMITTED BY:
ANAND KUMAR (A-11) ANKUR MITTAL (A-14) ANSHUL NAHAR (A-17)
ANIRUDDH SINGHL (A-12) ANKUR YADAV (A-15) ANUJ MITTAL (A-18)
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SUBMITTED TO:
MR. VINAY SINGH MARWAL
READER

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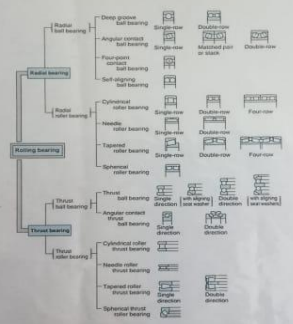
MANAGEMENT & GRAMOTHAN, JAIPUR
DEPARTMENT OF MECHANICAL ENGINEERING
DESIGN OF MACHINE ELEMENTS-1

TYPES OF BEARING:



SUBMITTED BY:
ANAND KUMAR (A-11) ANKUR MITTAL (A-14)ANSHUL NAHAR (A-17)
ANIRUDDH SINGHL (A-12) ANKUR YADAV (A-15) ANUJ MITTAL (A-18)
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SUBMITTED TO:
MR. VINAY SINGH MARWAL
READER

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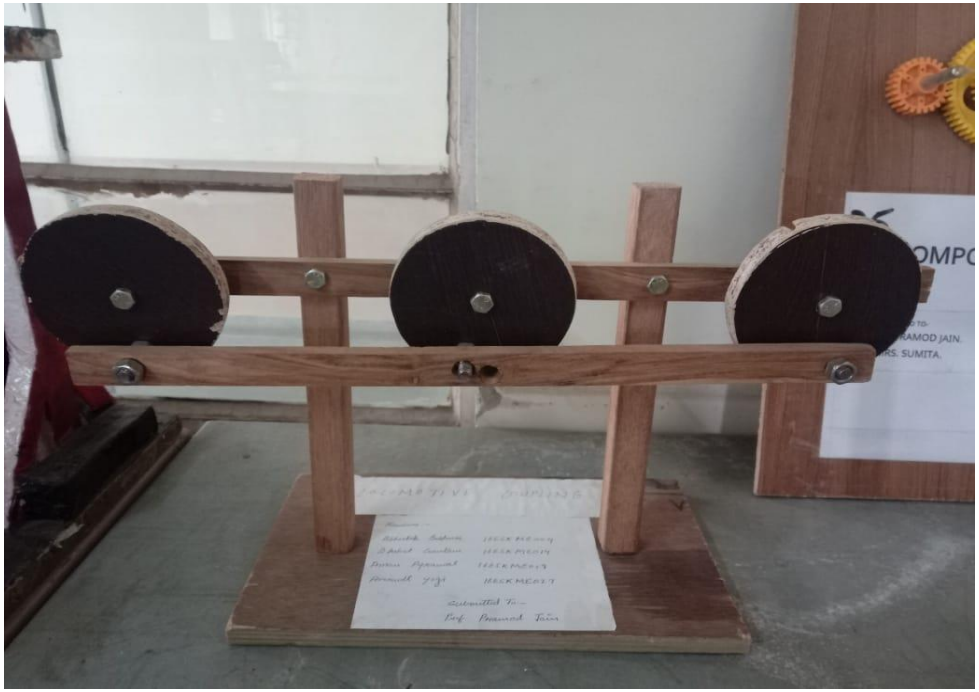
MANAGEMENT $ GRAMOTHAN, JAIPUR
DEPARTMENT OF MECHANICAL ENGINEERING
DESIGN OF MACHINE ELEMENTS-1

PLUMMER BLOCK (PILLOW BLOCK) BEARING:

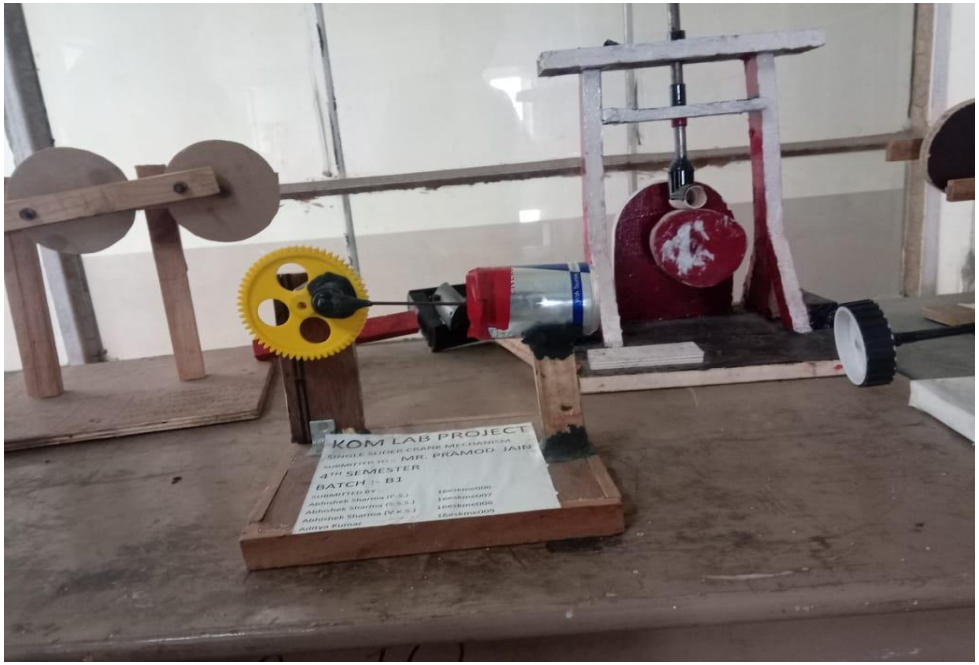
A PILLOW BLOCK , ALSO KNOWN AS PLUMMER BLOCK OR BEARING HOUSING, IS A PEDESTAL USE TO PROVIDE SUPPORT FOR A ROTATING SHAFT WITH THE HELP OF COMPATIBLE BEARINGS AND VARIOUS ACCESSORIES .HOUSING MATERIAL FOR A PILLOW BLOCK IS TYPICALLY MADE OF CAST IRON OR CAST STEEL.

SUBMITTED BY:
ANAND KUMAR (A-11) ANKUR MITTAL (A-14) ANSHUL NAHAR (A-17)
ANIRUDDH SINGHL (A-12) ANKUR YADAV (A-15) ANUJ MITTAL (A-18)
ANKIT AGARWAL (A-13) ANSHUL MAHESHWARI (A-16) ANOOP BHARADIA (A-19) (DEPARTMENT OF MECHANICAL ENGG.)

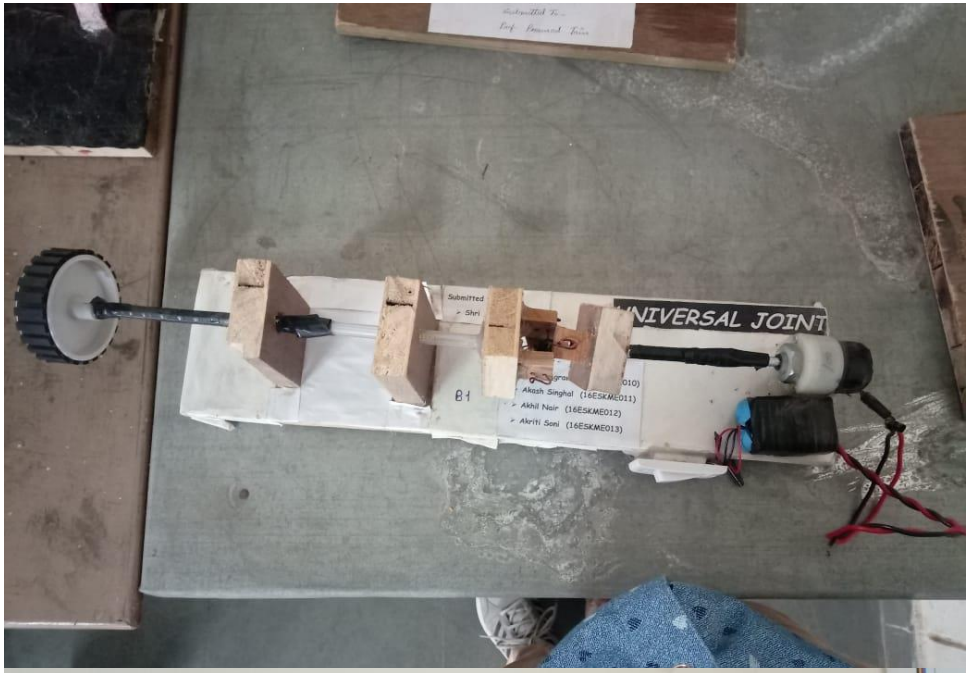
SUBMITTED TO:
MR. VINAY SINGH MARWAL
READER

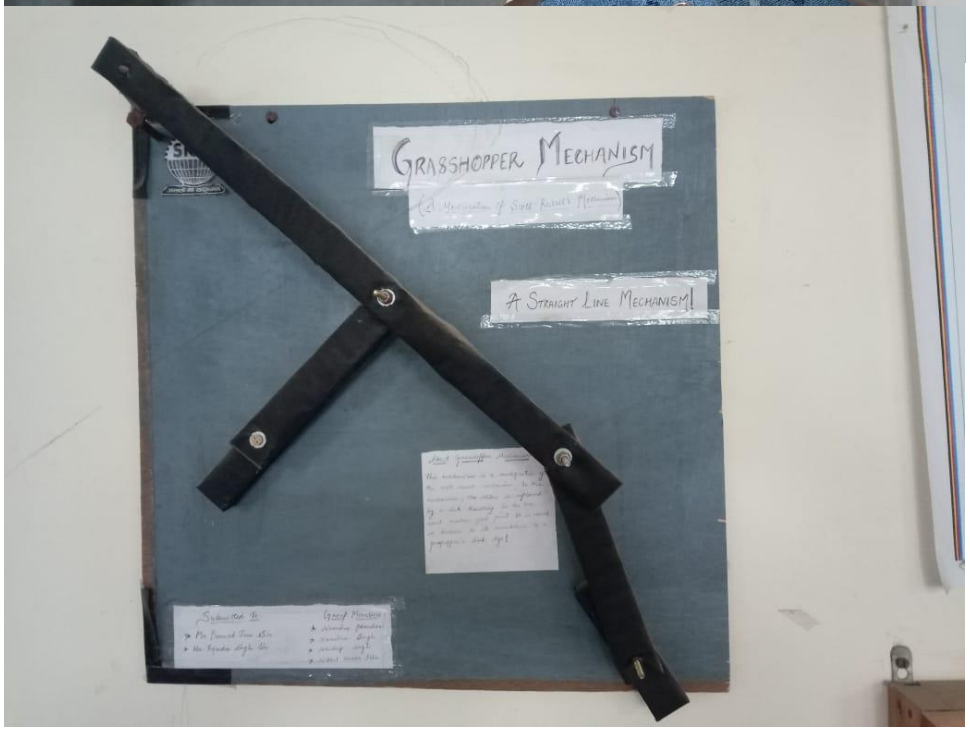


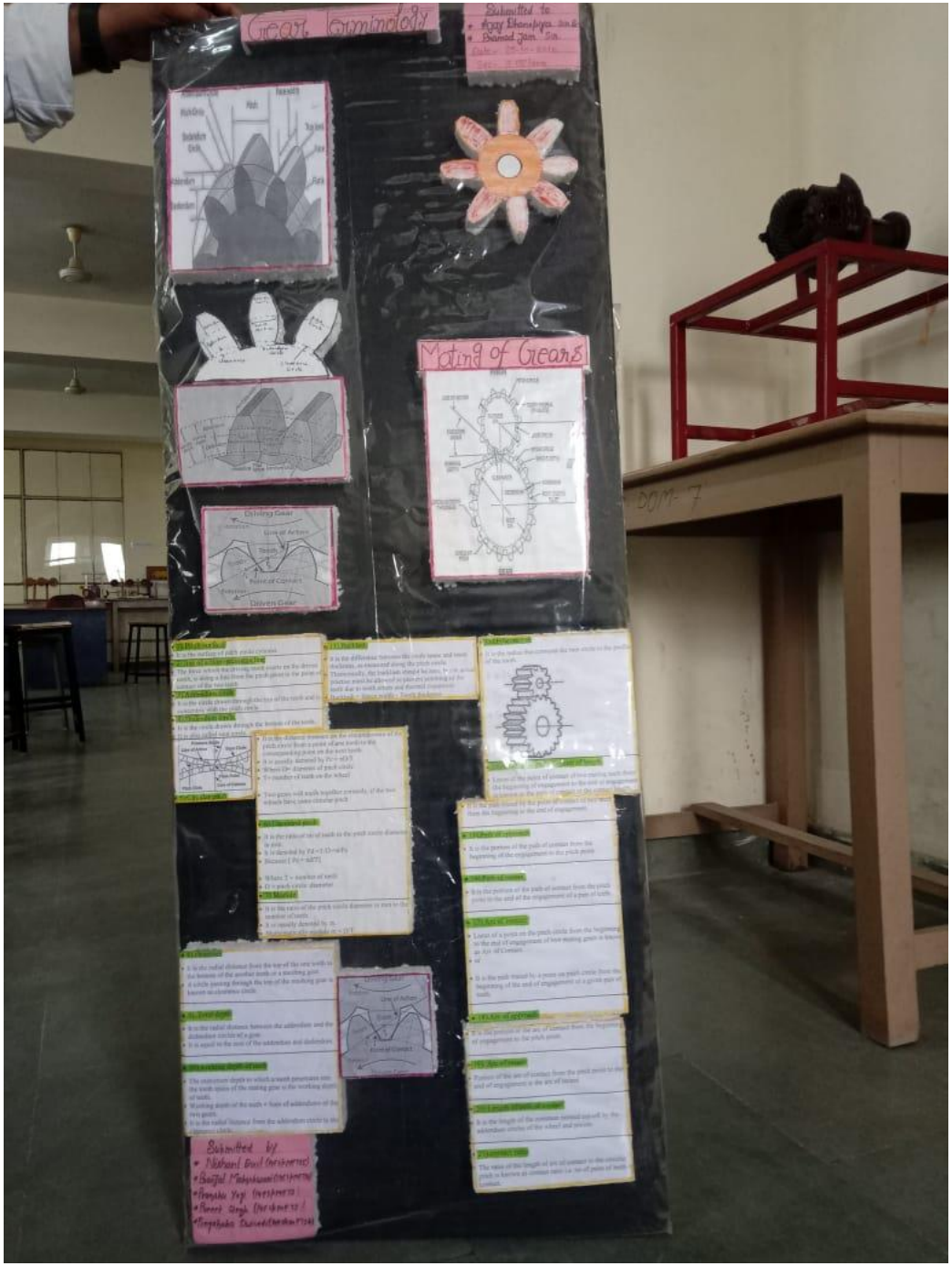

KOM LAB PROJECT
SINGLE SLIDER CRANK MECHANISM
SUBMITTED TO :- MR. PRAMOD JAIN
4TH SEMESTER
BATCH :- B1
SUBMITTED BY :-
Abhishek Sharma (P.S.) 16eskme006
Abhishek Sharma (S.S.S.) 16eskme007
Abhishek Sharma (V.K.S.) 16eskme008
Aditya Kumar 16eskme009


KOM LAB PROJECT
MR. PRAMOD JAIN
4TH SEMESTER
BATCH : B1

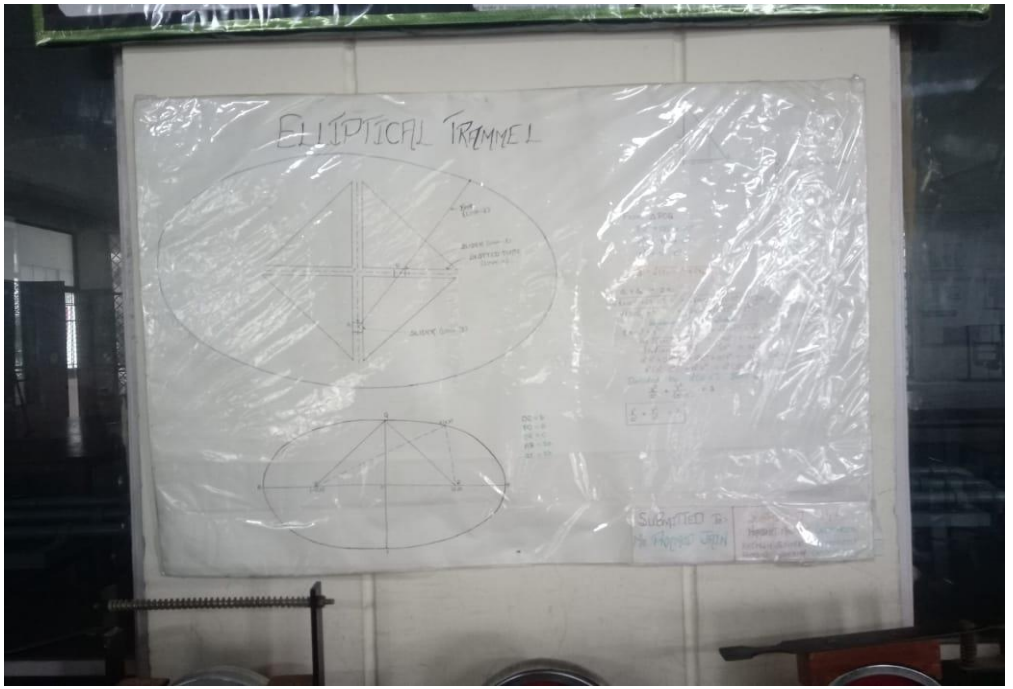

25
COMPOUND GEAR TRAIN
V - SEMESTER
SUBMITTED TO-
- MR.PRAMOD JAIN.
- MRS. SUMITA.
SUBMITTED BY-
KARAN YADAV
JITENDRA SINGH
JEETURAM
JEETENDRA KUMAR

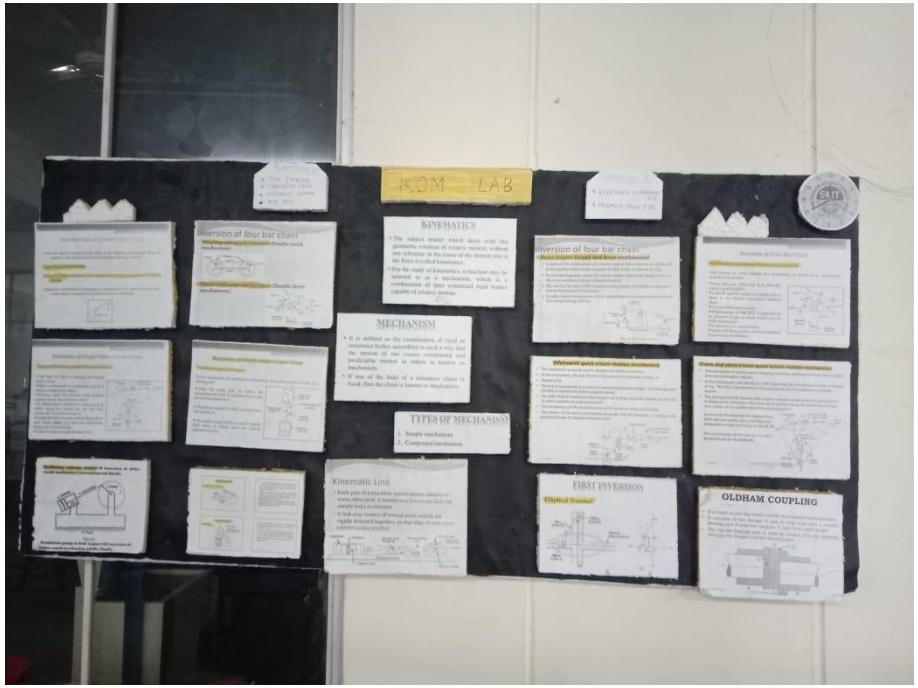

NIVERSAL JOINT
B1
Akash Singhal (16ESKME011)
Akhil Nair (16ESKME012)
Akriti Soni (16ESKME013)

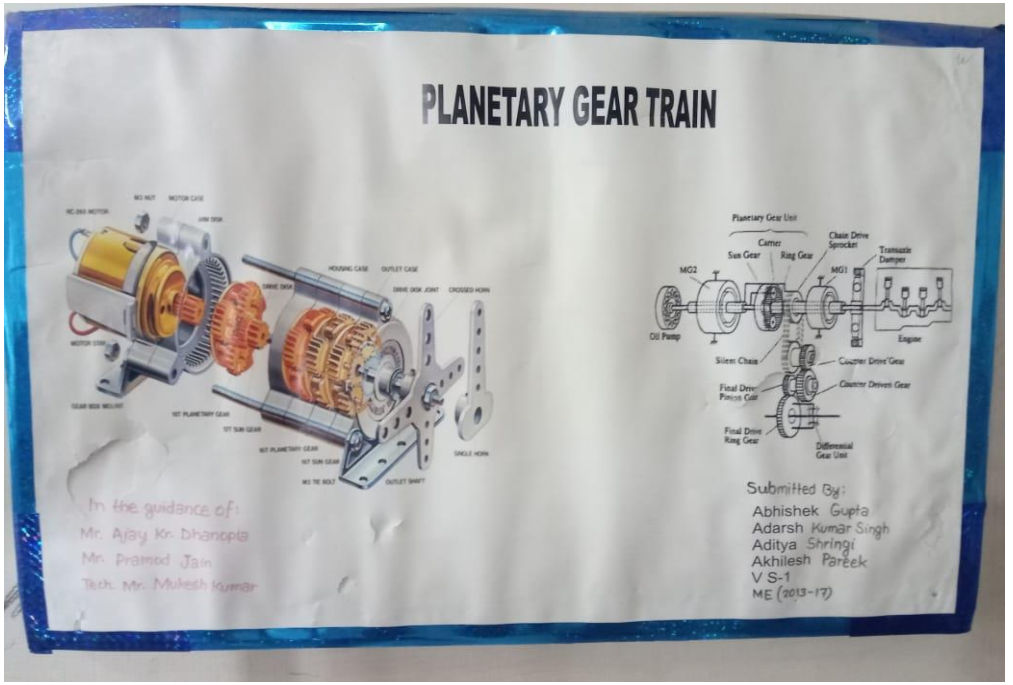

GRASSHOPPER MECHANISM
A STRAIGHT LINE MECHANISM


Gear Terminology
Mating of Gears
Driving Gear
Driven Gear
Submitted by

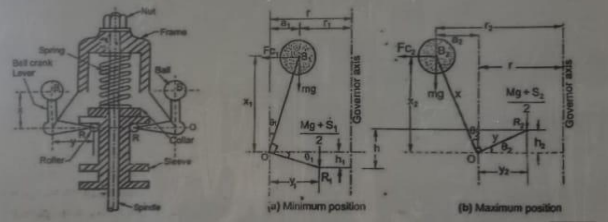

STATIC AND DYNAMIC BALANCING
BALANCING:-
1.STATIC BALANCING
2.DYNAMIC BALANCING
SUBMITTED TO,
MR. AJAY DHANOPIA SIR
MR. PRAMOD JAIN SIR
SUBMITTED BY,
NITESH KUMAR THAKUR
PANKAJ KUMAR JHAKAR
PRADEEP KUMAR
PRATEEK AGARWAL


ELLIPTICAL TRAMMEL


KOM LAB
KINEMATICS
MECHANISM
TYPES OF MECHANISM
Kinematic Link
OLDHAM COUPLING


PLANETARY GEAR TRAIN
In the guidance of:
Mr. Ajay Kr. Dhanopia
Mr. Pramod Jain
Tech. Mr. Mukesh Kumar
Submitted By:
Abhishek Gupta
Adarsh Kumar Singh
Aditya Shringi
Akhilesh Pareek
V S-1
ME (2013-17)

HARTNELL GOVERNOR



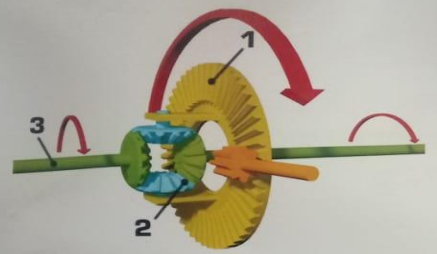
Submit to
Pramod Jain
Ajay Kumar Dhanopia

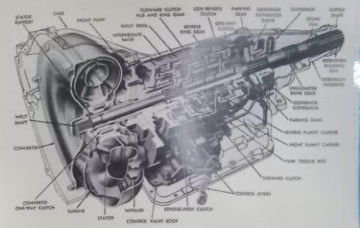
Submit by
Rinesh Kumar
Rupak Kumar
Saksham Mathur
S.A. Rehman

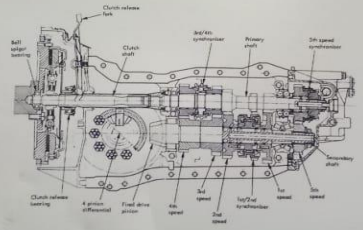
Batch S(2)
ME 2nd SHIFT

UNIVERSAL GOVERNOR

DIFFERENTIAL GEAR BOX



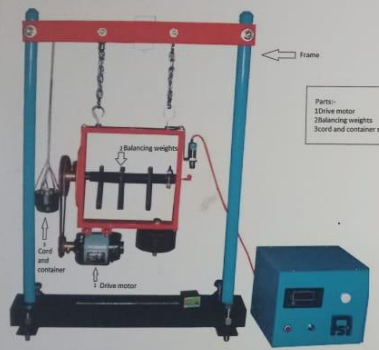




SUBMITTED TO-AJAY DHANOPIA SIR
PRAMOD JAIN SIR
Tec. MUKESH KUMAR

SUBMITTED BY - DEEPAK SHARM
DEEPAK NAGAR
DILEEP KUMAWAT
GEETENDU SHARMA
ME-S
2013-2017

STATIC AND DYNAMIC BALANCING



Parts:-
1Drive motor
2Balancing weights
3cord and container system

BALANCING:-
1.STATIC BALANCING
2.DYNAMIC BALANCING

Static Balance:-
Static balance occurs when the centre of gravity of an object is on the axis of rotation. The object can therefore remain stationary, with the axis horizontal, without the application of any braking force. It has no tendency to rotate due to the force of gravity.

Dynamic Balance:-
A rotating system of mass is in dynamic balance when the rotation does not produce any resultant centrifugal force or couple. The system rotates without requiring the application of any external force or couple

Salient features of Static And Dynamic Balancing Apparatus:

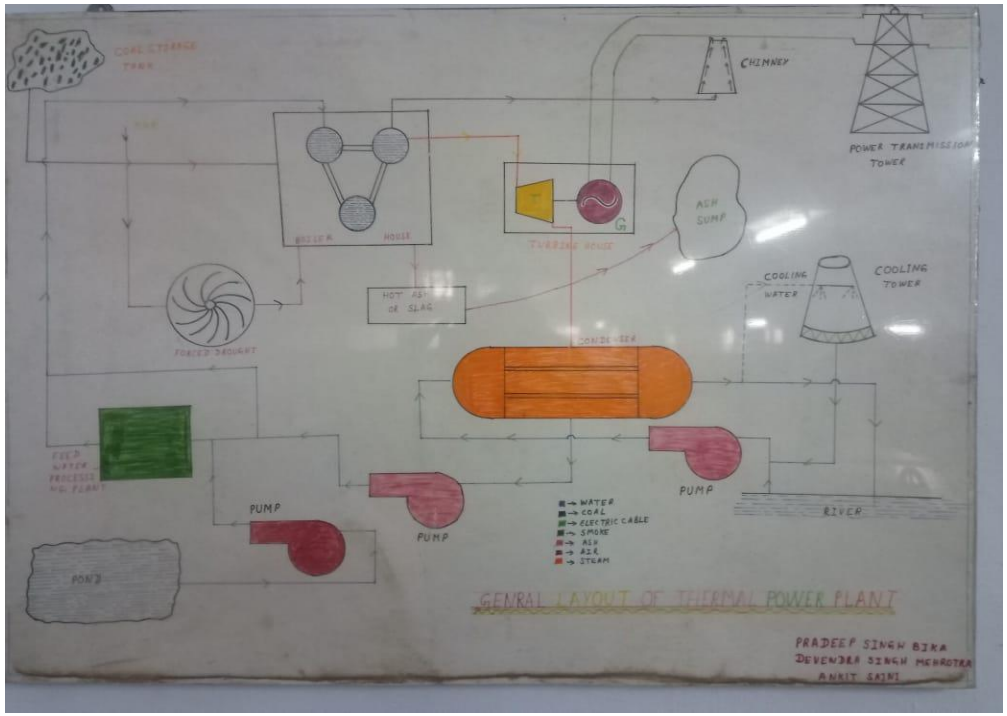
1. Independent analysis of Static and Dynamic balancing.
2. Adjustable balance weights with variable moments.
3. Accurate measurement of balance weight position both radially and longitudinally.

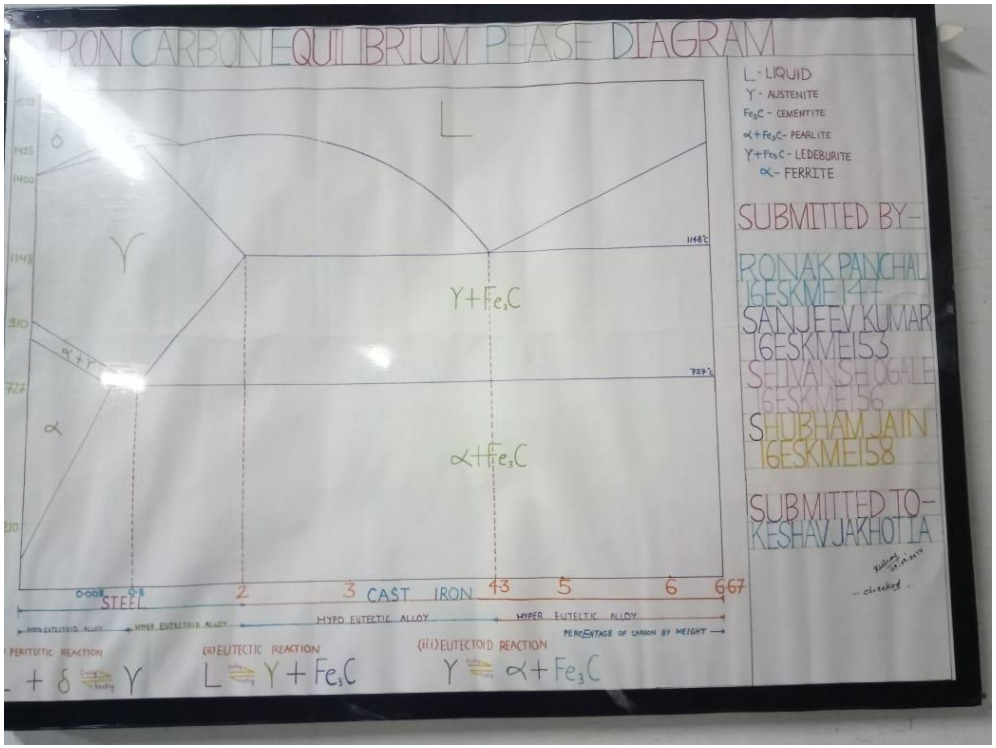
RANGE OF EXPERIMENTS:
1. Static balancing of system using steel balls.
2. Dynamic balancing of a simple rotating mass system.
3. Observation of effect of unbalance in a rotating mass system.

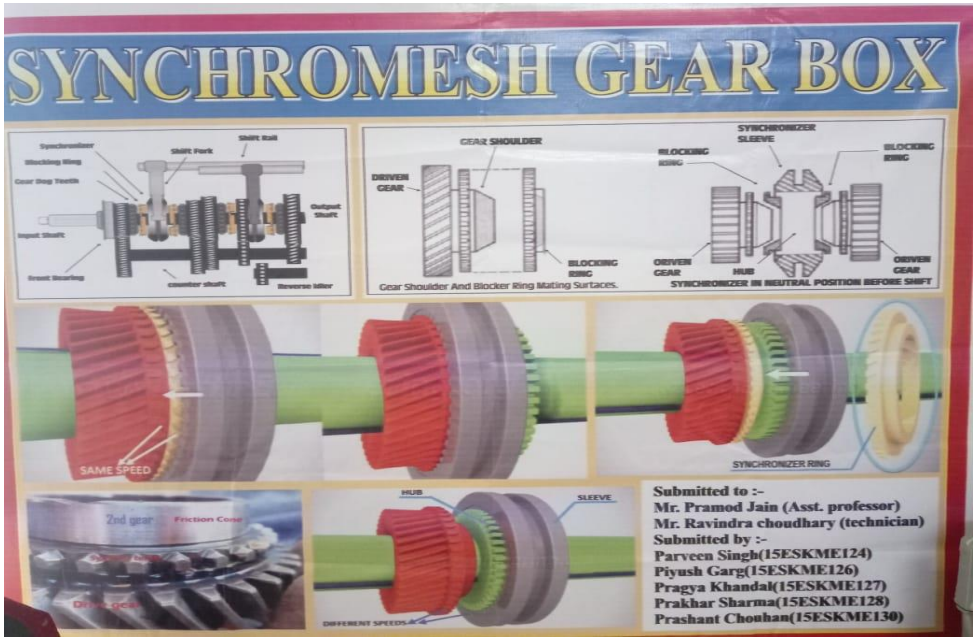
SPECIFICATION:
1. Drive Motor – F.H.P. Universal motor.
2. Balancing Weights – 4 nos with different sized drills for varying the unbalance.
3. Cord and container system with precision steel balls for relative weight measurement.

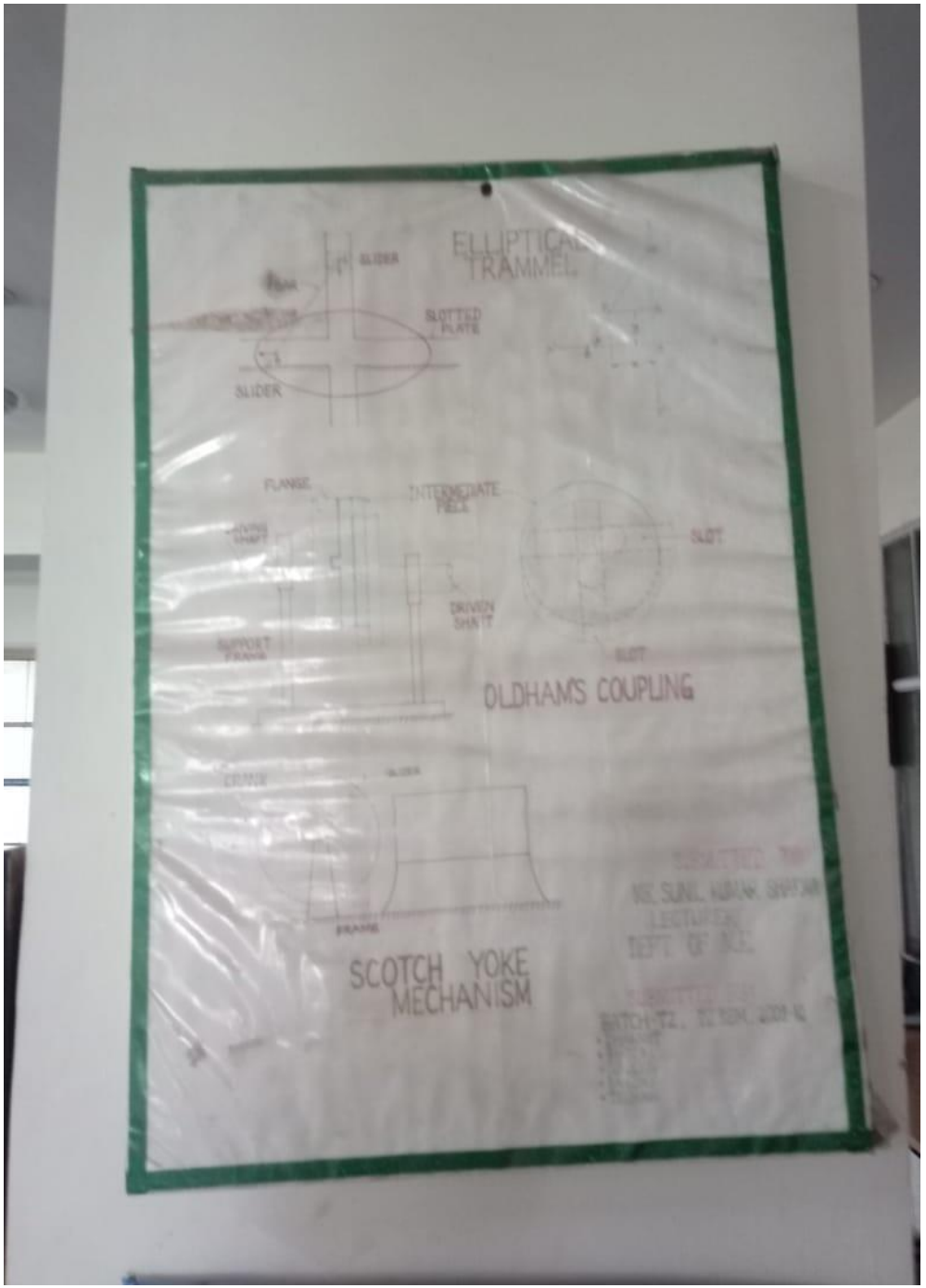
SUBMITTED TO.
MR. AJAY DHANOPIA SIR
MR. PRAMOD JAIN SIR

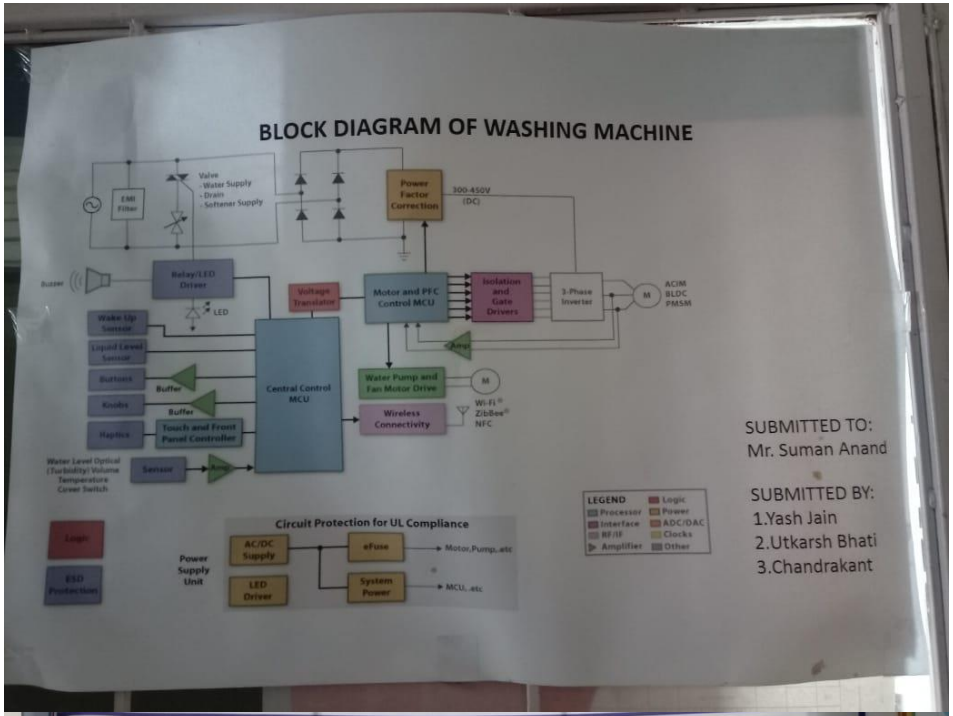
SUBMITTED BY.
NITESH KUMAR THAKUR
PANKAJ KUMAR JHAKAR
PRADEEP KUMAR
PRATEEK AGARWAL

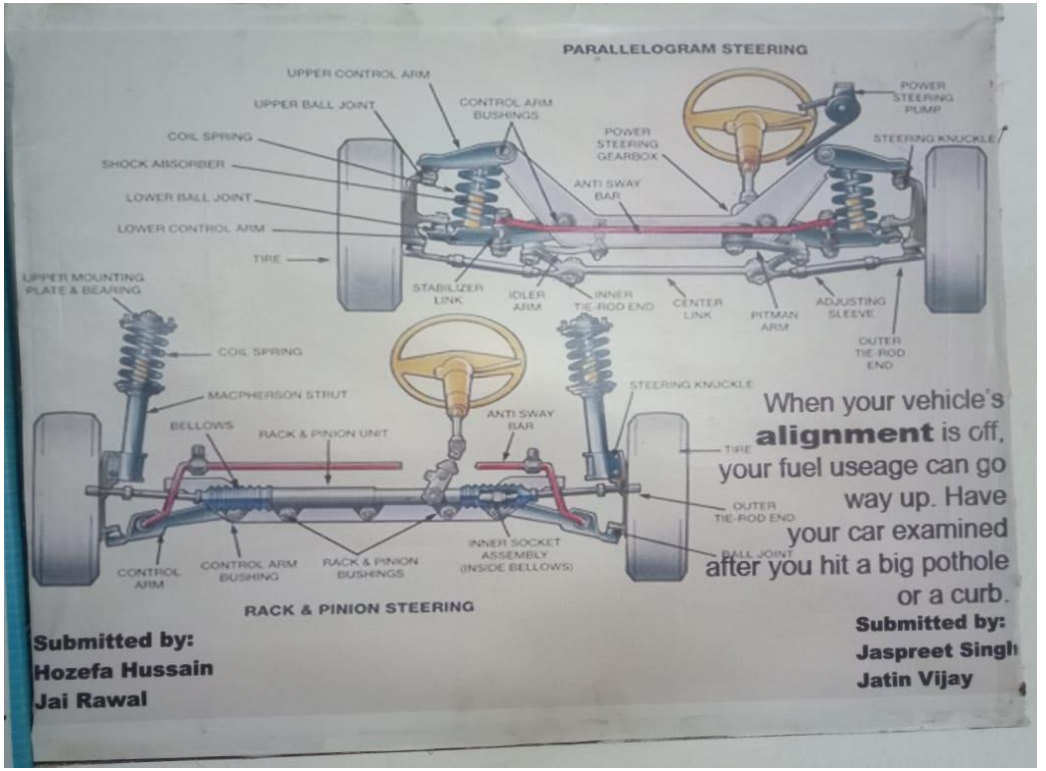


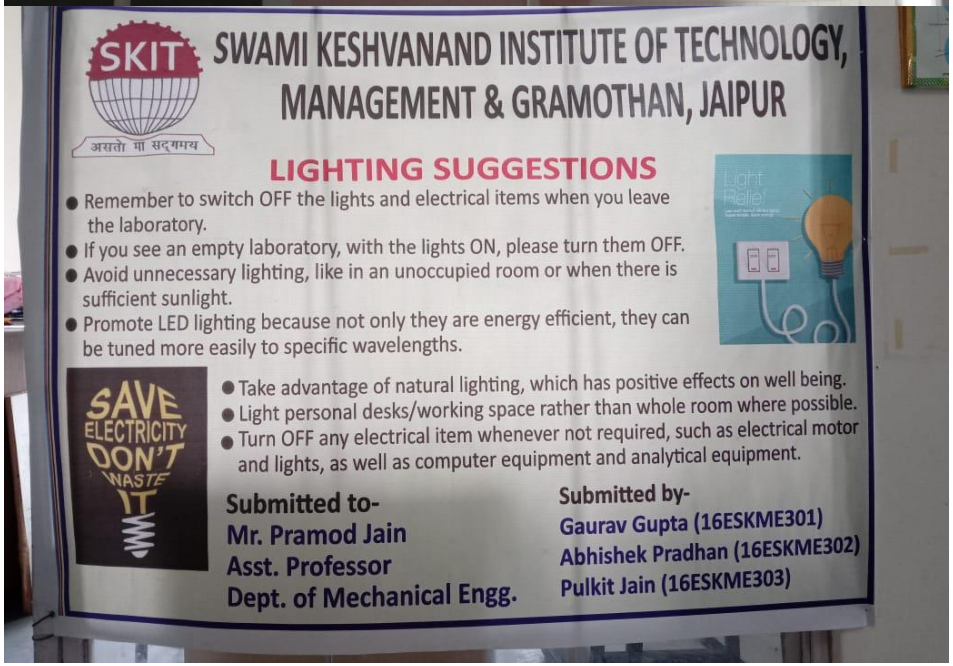

IRON CARBON EQUILIBRIUM PHASE DIAGRAM
L - LIQUID
Y - AUSTENITE
Fe3C - CEMENTITE
α+Fe3C - PEARLITE
Y+Fe3C - LEDEBURITE
α - FERRITE
SUBMITTED BY:-
RONAK PANCHAL
16ESKME147
SANJEEV KUMAR
16ESKME153
SHIVANSH GOYAL
16ESKME156
SHUBHAM JAIN
16ESKME158
SUBMITTED TO-
KESHAV JAKHOTIA
L
Y
Y+Fe3C
α+Fe3C
1148°C
727°C
STEEL
CAST IRON
HYPO EUTECTIC ALLOY
HYPER EUTECTIC ALLOY
PERCENTAGE OF CARBON BY WEIGHT
(i) PERITETIC REACTION
(ii) EUTECTIC REACTION
L ⇌ Y + Fe3C
(iii) EUTECTOID REACTION
Y ⇌ α + Fe3C

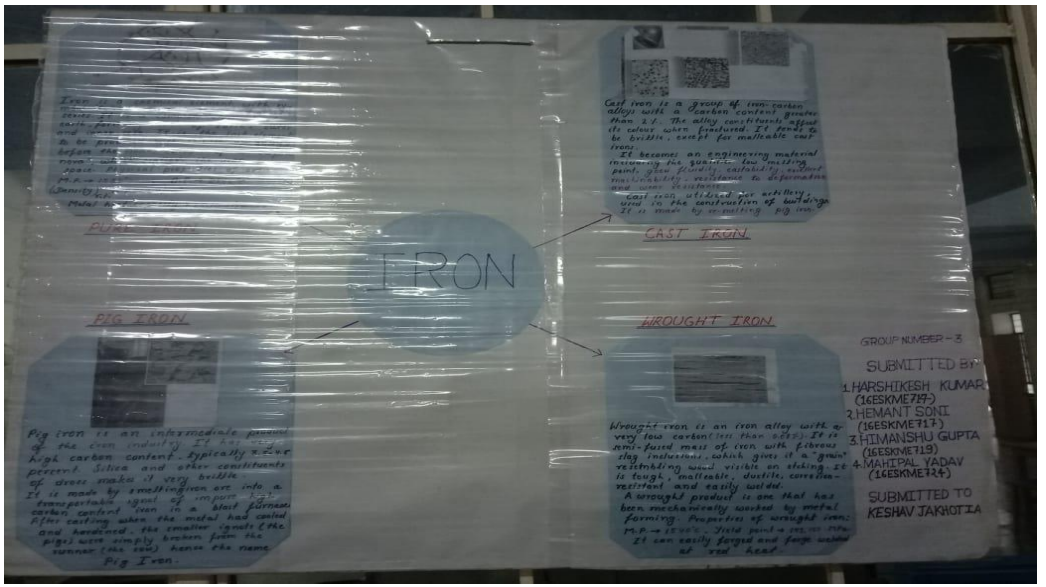

SYNCHROMESH GEAR BOX
Shift Fork
Shift Rail
Output Shaft
Input Shaft
counter shaft
Reverse Idler
GEAR SHOULDER
DRIVEN GEAR
BLOCKING RING
Gear Shoulder And Blocker Ring Mating Surfaces.
SYNCHRONIZER SLEEVE
HUB
SYNCHRONIZER IN NEUTRAL POSITION BEFORE SHIFT
SAME SPEED
SYNCHRONIZER RING
2nd gear
Friction Cone
HUB
SLEEVE
DIFFERENT SPEEDS
Submitted to :-
Mr. Pramod Jain (Asst. professor)
Mr. Ravindra choudhary (technician)
Submitted by :-
Parveen Singh(15ESKME124)
Piyush Garg(15ESKME126)
Pragya Khandal(15ESKME127)
Prakhar Sharma(15ESKME128)
Prashant Chouhan(15ESKME130)


ELLIPTICAL TRAMMEL
SLIDER
SLOTTED PLATE
SLIDER
FLANGE
INTERMEDIATE PIECE
SLOT
DRIVEN SHAFT
SUPPORT FRAME
SLOT
OLDHAM'S COUPLING
SCOTCH YOKE MECHANISM


BLOCK DIAGRAM OF WASHING MACHINE
Power Factor Correction
300-450V (DC)
Relay/LED Driver
Voltage Translator
Motor and PFC Control MCU
Isolation and Gate Drivers
3-Phase Inverter
ACIM BLDC PMSM
Central Control MCU
Water Pump and Fan Motor Drive
Wireless Connectivity
Wi-Fi® ZibBee® NFC
Touch and Front Panel Controller
Circuit Protection for UL Compliance
AC/DC Supply
LED Driver
eFuse
System Power
Power Supply Unit
LEGEND
SUBMITTED TO:
Mr. Suman Anand
SUBMITTED BY:
1.Yash Jain
2.Utkarsh Bhati
3.Chandrakant

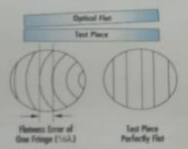

PARALLELOGRAM STEERING
UPPER CONTROL ARM
UPPER BALL JOINT
CONTROL ARM BUSHINGS
POWER STEERING PUMP
COIL SPRING
SHOCK ABSORBER
POWER STEERING GEARBOX
STEERING KNUCKLE
ANTI SWAY BAR
LOWER BALL JOINT
LOWER CONTROL ARM
TIRE
UPPER MOUNTING PLATE & BEARING
STABILIZER LINK
IDLER ARM
INNER TIE-ROD END
CENTER LINK
PITMAN ARM
ADJUSTING SLEEVE
OUTER TIE-ROD END
COIL SPRING
MACPHERSON STRUT
STEERING KNUCKLE
BELLOWS
RACK & PINION UNIT
ANTI SWAY BAR
TIRE
OUTER TIE-ROD END
BALL JOINT
CONTROL ARM
CONTROL ARM BUSHING
RACK & PINION BUSHINGS
INNER SOCKET ASSEMBLY (INSIDE BELLOWS)
RACK & PINION STEERING
When your vehicle's alignment is off, your fuel useage can go way up. Have your car examined after you hit a big pothole or a curb.
Submitted by:
Hozefa Hussain
Jai Rawal
Submitted by:
Jaspreet Singh
Jatin Vijay


SKIT
असतो मा सद्गमय
SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT & GRAMOTHAN, JAIPUR
LIGHTING SUGGESTIONS
Remember to switch OFF the lights and electrical items when you leave the laboratory.
If you see an empty laboratory, with the lights ON, please turn them OFF.
Avoid unnecessary lighting, like in an unoccupied room or when there is sufficient sunlight.
Promote LED lighting because not only they are energy efficient, they can be tuned more easily to specific wavelengths.
SAVE ELECTRICITY DON'T WASTE IT
Take advantage of natural lighting, which has positive effects on well being.
Light personal desks/working space rather than whole room where possible.
Turn OFF any electrical item whenever not required, such as electrical motor and lights, as well as computer equipment and analytical equipment.
Submitted to-
Mr. Pramod Jain
Asst. Professor
Dept. of Mechanical Engg.
Submitted by-
Gaurav Gupta (16ESKME301)
Abhishek Pradhan (16ESKME302)
Pulkit Jain (16ESKME303)


IRON
CAST IRON
PIG IRON
WROUGHT IRON
GROUP NUMBER - 3
SUBMITTED BY:
1.HARSHIKESH KUMAR (16ESKME719)
2.HEMANT SONI (16ESKME717)
3.HIMANSHU GUPTA (16ESKME718)
4.MAHIPAL YADAV (16ESKME724)
SUBMITTED TO
KESHAV JAKHOTIA

OPTICAL FLAT

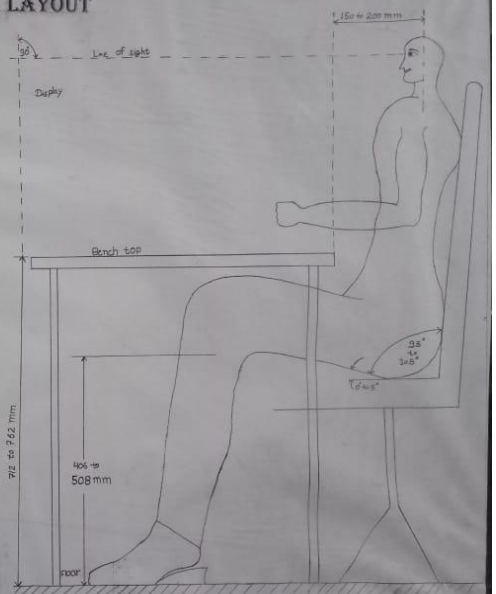
An **optical flat** is an optical-grade piece of glass lapped and polished to be extremely flat on one or both sides, usually within a few millionths of an inch (about 25 nanometres). They are used with [monochromatic light](#) to determine the flatness of other optical surfaces by [interference](#). When an optical flat is placed on another surface and illuminated, the light waves reflect off both the bottom surface of the flat and the surface it is resting on. This causes a phenomenon similar to [thin-film interference](#). The reflected waves interfere, creating a pattern of [interference fringes](#) visible as light and dark bands. The spacing between the fringes is smaller where the gap is changing more rapidly, indicating a departure from flatness in one of the two surfaces, in a similar way to the contour lines on a map. A flat surface is indicated by a pattern of straight, parallel fringes with equal spacing, while other patterns indicate uneven surfaces. Two adjacent fringes indicate a difference in elevation of one-half [wavelength](#) of the light used, so by counting the fringes differences in elevation of the surface can be measured to millionths of an inch.Usually only one of the two surfaces is made optically flat to the specified tolerance, and this surface is indicated by an arrow on the edge of the glass.



SUBMITTED TO:
MR. PRAVEEN SARASHWAT
MRS. MONIKA KHURANA

SUBMITTED BY:
SHUBHAM KOTHARI(55)
PRATEEK AGARWAL(39)

WORKPLACE LAYOUT



SEATING ARRANGEMENT FOR MAXIMUM COMFORT

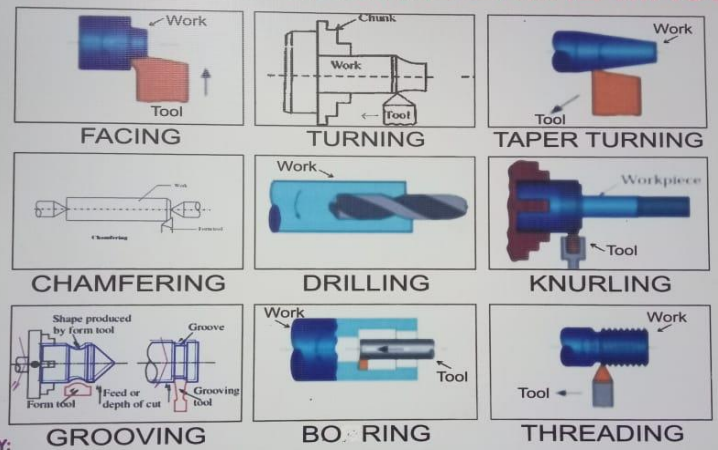
SUBMITTED TO :
MR. SUNIL KUMAR
LECTURER OF MEC. DEPTT

SUBMITTED BY:

1. JITENDRA KUMAR	BATCH : T1
2. DEEPAK KUMAR	SEM : 4th
3. DEVENDRA NAGAR	YEAR: 2nd
4. HARSHIT RAMESH	SESSION : 2009-2010
5. HIMANSHU SHEKHAR	BRANCH : MECHANICAL

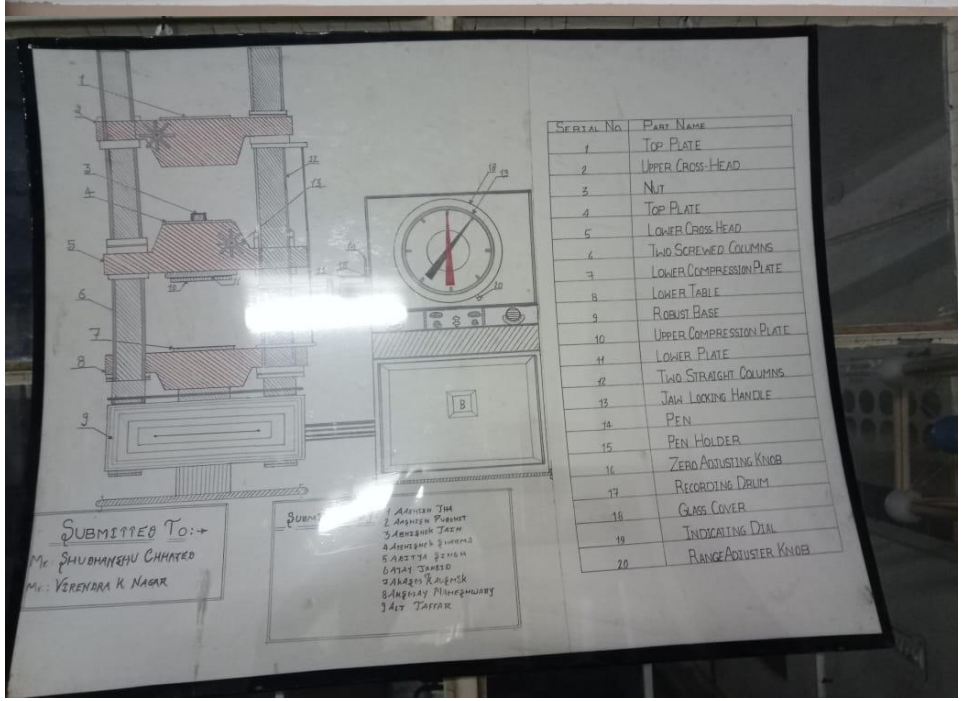
SKIT - JAIPUR

OPERATIONS OF CENTRE LATHE MACHINE



SUBMITTED BY:
GROUP -G2

HARISH KUMAR	- 43
HAR SH VARDHAN SINGH CHUNDAWAT	- 44
HIMANSHU GOYAL	- 45
HIMANSHU PARMAR	- 46



SERIAL NO.	PART NAME
1	TOP PLATE
2	UPPER CROSS-HEAD
3	NUT
4	TOP PLATE
5	LOWER CROSS HEAD
6	TWO SCREWED COLUMNS
7	LOWER COMPRESSION PLATE
8	LOWER TABLE
9	ROBUST BASE
10	UPPER COMPRESSION PLATE
11	LOWER PLATE
12	TWO STRAIGHT COLUMNS
13	JAW LOCKING HANDLE
14	PEN
15	PEN HOLDER
16	ZERO ADJUSTING KNOB
17	RECORDING DRUM
18	GLASS COVER
19	INDICATING DIAL
20	RANGE ADJUSTER KNOB

PEDESTAL GRINDER

असतो मा सद्गमय

SUBMITTED TO:
Sudesh Garg

SUBMITTED BY:
Manas Jain, Manan Jain, Naveen Baloda,
Mansi Kataria, Meenakshi Meena

PLUG GAUGE & SNAP GAUGE

Submitted To
Mrs. Monika Khurana
Mr. Parveen Saraswat

Submitted By
Rahul Tyagi
Saksham Mathur

Swami Keshvanand Institute of Technology,
Management & Gramothan, Jaipur

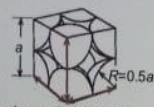
DEPARTMENT OF MECHANICAL ENGINEERING

Atomic Packing Factor (APF):SC

$$APF = \frac{\text{Volume of atoms in unit cell*}}{\text{Volume of unit cell}}$$

*assume hard spheres

- APF for a simple cubic structure = 0.52

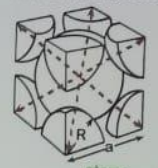


close-packed directions contains 8 x 1/8 = 1 atom/unit cell

$$APF = \frac{\text{atoms/unit cell} \times \frac{4}{3}\pi(0.5a)^3 \times \text{volume/atom}}{a^3 \times \text{volume/unit cell}}$$

ATOMIC PACKING FACTOR: BCC

- APF for a body-centered cubic structure = 0.68



Close-packed directions:
length = 4R
$=\sqrt{3}\,a$

Unit cell contains:
1 + 8 x 1/8
= 2 atoms/unit cell

$$APF = \frac{\text{atoms/unit cell} \times \frac{4}{3}\pi(\sqrt{3}a/4)^3 \times \text{volume/atom}}{a^3 \times \text{volume/unit cell}}$$

Atomic Packing Factor: FCC

- APF for a face-centered cubic structure = 0.74 maximum achievable APF

Close-packed directions:
length = $4R = \sqrt{2}\,a$

Unit cell contains:
6 x 1/2 + 8 x 1/8
= 4 atoms/unit cell

$$APF = \frac{\text{atoms/unit cell} \times \frac{4}{3}\pi(\sqrt{2}a/4)^3 \times \text{volume/atom}}{a^3 \times \text{volume/unit cell}}$$

APF for HCP

A sites
B sites
A sites

C=1.633a

Number of atoms in HCP unit cell=
(12*1/6)+(2*1/2)+3=6atoms

Vol.of HCP unit cell=
area of the hexagonal face X height of the hexagonal
Area of the hexagonal face=area of each triangle X6

Area of triangle $= \frac{bh}{2} = \frac{ah}{2} = \frac{1}{2}a.\frac{a\sqrt{3}}{2}$

Area of hexagon $= 6.\frac{a^2\sqrt{3}}{4}$

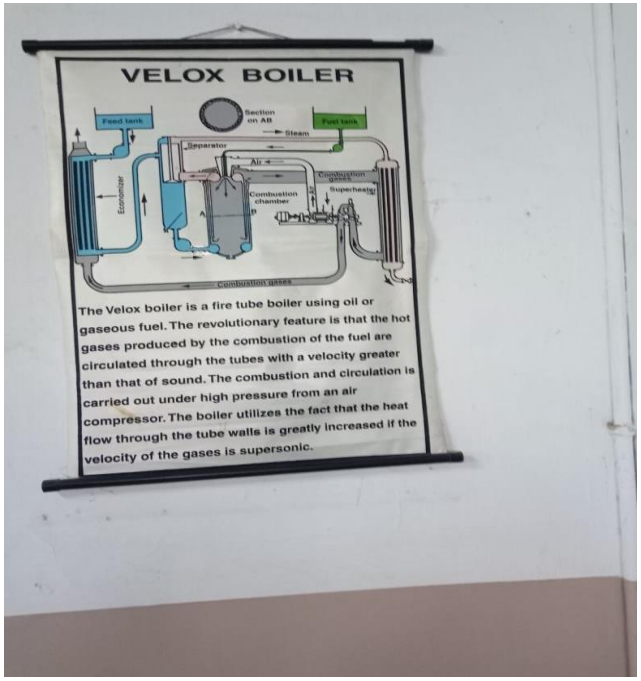
Volume of HCP $= 6.\frac{a^2\sqrt{3}}{4}.C = 6.\frac{a^2\sqrt{3}}{4}.1.633a$

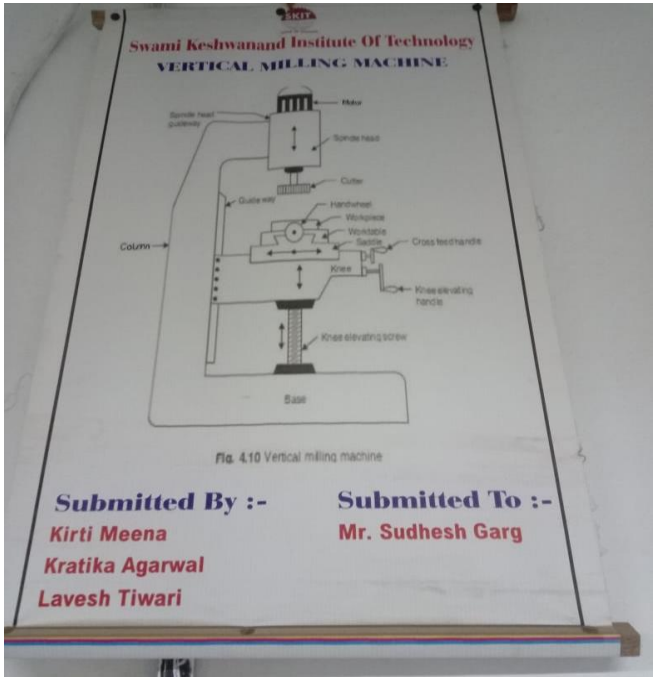
$APF = 6 * \frac{4\pi r^3}{3} / (\frac{\sqrt{3}}{4} * 6 * 1.633 * a3)$

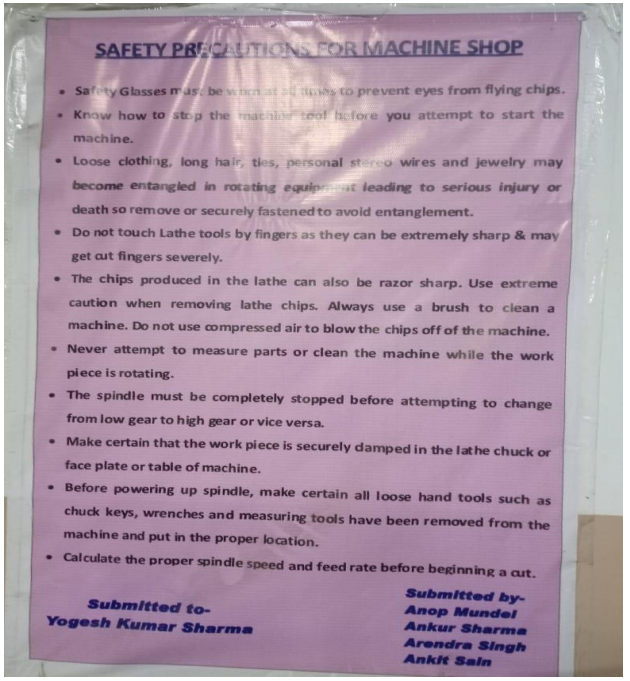
APF =0.74

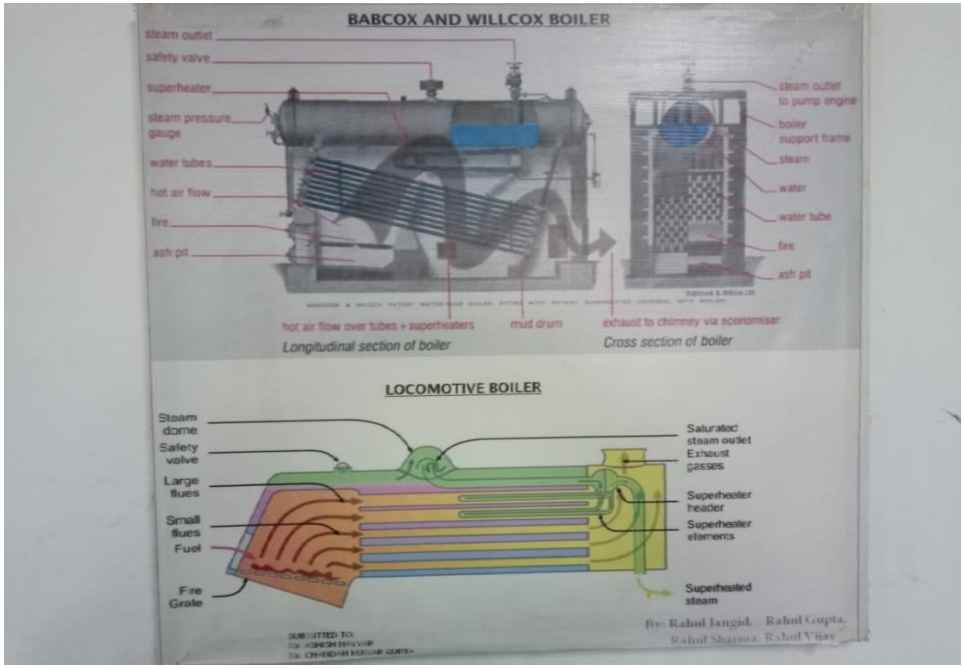
Submitted to:-
Mr. Keshav Jakhotia

Submitted By:- (Group - 6)
1. Tirupati Singh(ME172)
2. Veerendra Singh(ME176)
3. Vijay Kr. Sh...


VELOX BOILER
Feed tank
Section on AB
Fuel tank
Steam
Separator
Air
Economizer
Combustion chamber
Superheater
Combustion gases
The Velox boiler is a fire tube boiler using oil or gaseous fuel. The revolutionary feature is that the hot gases produced by the combustion of the fuel are circulated through the tubes with a velocity greater than that of sound. The combustion and circulation is carried out under high pressure from an air compressor. The boiler utilizes the fact that the heat flow through the tube walls is greatly increased if the velocity of the gases is supersonic.


Swami Keshwanand Institute Of Technology
VERTICAL MILLING MACHINE
Motor
Spindle head
Cutter
Guide way
Handwheel
Workpiece
Worktable
Saddle
Cross feed handle
Knee
Knee elevating handle
Knee elevating screw
Column
Base
Fig. 4.10 Vertical milling machine
Submitted By :-
Kirti Meena
Kratika Agarwal
Lavesh Tiwari
Submitted To :-
Mr. Sudhesh Garg

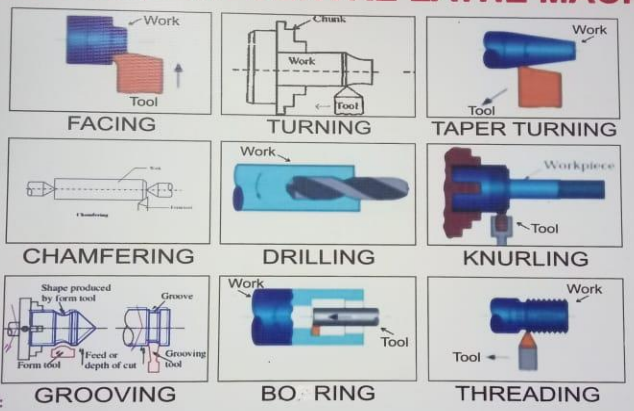

SAFETY PRECAUTIONS FOR MACHINE SHOP
Safety Glasses must be worn at all times to prevent eyes from flying chips.
Know how to stop the machine tool before you attempt to start the machine.
Loose clothing, long hair, ties, personal stereo wires and jewelry may become entangled in rotating equipment leading to serious injury or death so remove or securely fastened to avoid entanglement.
Do not touch Lathe tools by fingers as they can be extremely sharp & may get cut fingers severely.
The chips produced in the lathe can also be razor sharp. Use extreme caution when removing lathe chips. Always use a brush to clean a machine. Do not use compressed air to blow the chips off of the machine.
Never attempt to measure parts or clean the machine while the work piece is rotating.
The spindle must be completely stopped before attempting to change from low gear to high gear or vice versa.
Make certain that the work piece is securely damped in the lathe chuck or face plate or table of machine.
Before powering up spindle, make certain all loose hand tools such as chuck keys, wrenches and measuring tools have been removed from the machine and put in the proper location.
Calculate the proper spindle speed and feed rate before beginning a cut.
Submitted to-
Yogesh Kumar Sharma
Submitted by-
Anop Mundel
Ankur Sharma
Arendra Singh
Ankit Sain


BABCOX AND WILLCOX BOILER
steam outlet
safety valve
superheater
steam pressure gauge
water tubes
hot air flow
fire
ash pit
steam outlet to pump engine
boiler support frame
steam
water
water tube
fire
ash pit
hot air flow over tubes + superheaters
mud drum
exhaust to chimney via economiser
Longitudinal section of boiler
Cross section of boiler
LOCOMOTIVE BOILER
Steam dome
Safety valve
Large flues
Small flues
Fuel
Fire Grate
Saturated steam outlet
Exhaust gasses
Superheater header
Superheater elements
Superheated steam
By: Rahul Jangid, Rahul Gupta, Rahul Sharma, Rahul Vijay


"CLEAN INDIA GREEN INDIA"
IF YOU WILL SAVE TREES NOW, THEN TREES WILL SAVE YOU AFTER WORDS ;
KEEP YOUR CITY CLEAN NOT GREY.
KEEP YOUR CITY CLEAN & GREEN
Submitted to
Pramod Jain
Submitted by
Jitendra Lakhara
V^th Sem. Section-A

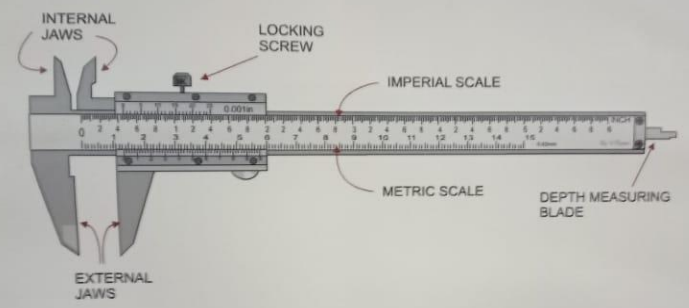
SKIT - JAIPUR

OPERATIONS OF CENTRE LATHE MACHINE



SUBMITTED BY:
GROUP -G2
HARISH KUMAR - 43
HAR SH VARDHAN SINGH CHUNDAWAT - 44
HIMANSHU GOYAL - 45
HIMANSHU PARMAR - 46

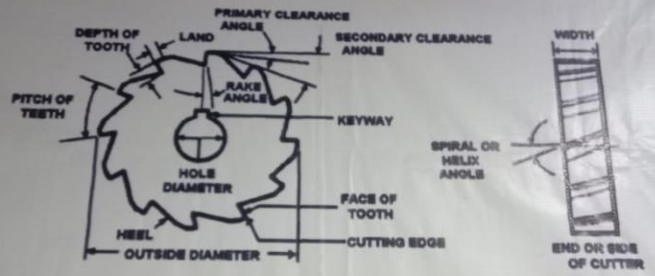
VERNIER CALIPER



Submitted To
Mrs. Monika Khurana
Mr. Praveen Saraswat

Submitted by
MANISH VIJAY
LALCHAND SHARMA

Geometry of Plane Milling Cutter



Submitted to:
Mr. Yogesh Sharma

Submitted by:
Amit Agrawal
Anay Mathur
Aman Rawat
Anirudh Singh

SINE BAR

Fig. Checking of unknown angles of small components

Fig. Checking of unknown angles of heavy components

Submitted to:
Mrs. MONIKA KHURANA
Mr. PRAVEEN SARASWAT

Submitted by:
VISHAL SHARMA
YOGESH SHARMA

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT AND GRAMOTHAN

Mechanical Workshop

Submitted to : Mr.SUDESH GARG

SECTION : G

Submitted By : ABHISHEK GARG

ABHISHEK GARG

Some sheet metal shop tools

USED FOR MAKING INDENTATION MARKS FOR LOCATING CENTER POSITION FOR DIVIDERS. It HAS A TAPER ANGLE OF 30°

Prick punch

USED FOR MARKING THE LOCATION OF POINTS AND CENTERING HOLE TO BE DRILLED. IT HAS A TAPER ANGLE OF 90°

CENTER PUNCH

Blades are straight. *It is used to cut 22 SWG or lighter sheets along straight line.*

STRAIGHT SNIP

Blades are curved back from the cutting edges; *it is used to cut discs and round articles from sheets.*

BENT SNIP

These are *used for cutting sheets, rivets and bolts.*

CHISELS

Hammers are used for bending of sheets, smoothening of sheets, locking of joints and riveting work

(a) General purpose, face is slightly curved, and head is round

BALL PEEN HAMMER

(b) It has square flat face, used for flattening of seams.

SQUARE FACE HAMMER

(a) Made of good quality of wood or plastic used whenever light force is required

MALLET

Available in different sizes, it could be steel foot rule, folding rule or tape rule.

STEEL RULE

It is a steel wire with one end sharp and hardened *to make lines on metallic sheet*

SCRIBERS

It is L-shaped piece of hardened steel, *used to make square corners, checking and setting right angle*

STEEL SQUARE

MECHANICAL TOOLS

Fix Spanner
To Grip a nut or bolt

Ring Spanner
Used for Tightening and lossing bolts

Ajustable Spanner
used to faster differant size of nuths bolts

Socket Set
Used for loosing & Tightening nuts & bolts

Pliters
Used to hold objects bismly

Nose Plier
used For holding wires used by electricians

Plier Wrench
used for holding the Object for tightening & Lossing

Hammer
Used for breaking object

Screer Driver
used for driving screw

Vernier calliper
used to mesuse diameter

Tachometer
used to measure rpm

Submitted by
Narendra jhajhria, Mudit,
Mohan, Nemish Bhatt,
Nimish Shukla, Mrityunjay,
MD. Fadahiqubal, MD. Nadim Akhtar

GEAR CUTTING ATTACHMENTS

CUTTER GUIDE
CUTTER HEAD
CUTTER BODY
CUTTER
BED
BASE
PROFILE BLOCK
WORK SLIDE
GEAR

FEATURES OF GEAR SHAPING MACHING

GEAR SHAPING OPERATION

OVERARM
TAIL STOCK
CUTTER
HOB HEAD
STEADY COLUMN
COLUMN
WORK TABLE
BED
TABLE SLIDE
DIVIDING HEAD
WORK

GEAR HOBBING MACHINE

MILLING OF GEAR

HOB
JOB
RADIAL FEED
AXIAL FEED

AXIAL HOBBING

RADIAL HOBBING

engart

Swami Keshwanand Institute Of Technology

VERTICAL MILLING MACHINE

Column
Knee
Base

Fig. 4.10 Vertical milling machine

Submitted By :-
Kirti Meena
Kratika Agarwal
Lavesh Tiwari

Submitted To :-
Mr. Sudhesh Garg

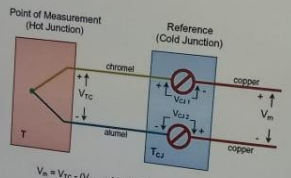
CENTRE LATHE

1 MAIN
2 HEAD
3 GEAR BOX CONTROLS
4 DRIVING CLUTCH CONTROLS LEVER
5 CHUCK
6 RACK
7 TOOL POST
8 TOOL POST SLIDE
9 CROSS SLIDE
10 REVERSE FOR SLIDING AND SURFACING
11 SCREW CUTTING ENGAGE
12 FEED ENGAGE
13 CARRIAGE
14 DEAD CENTER
15 RAMP CLAMP
16 TAIL STOCK
17 LEAD SCREW
18 FEED ROD
19 GAP PIECE
20 BED 23 STUDS SUMP
21 FEED BOX
22 TRAY

engart

Thermocouple Technique ForTemperature Measurement

To measure the temperature using a thermocouple, you cannot simply connect the thermocouple to a voltmeter or other measurement system, because the voltage measured is proportional to the temperature difference between the primary junction and the junction where the voltage is being measured. Therefore, to know the absolute temperature at the thermocouple tip, the temperature where the thermocouple is connected to the measurement device must also be known.

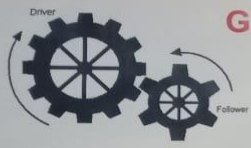


$V_m = V_{TC} - (V_{CJ1} + V_{CJ2}) = V_{TC} - V_{CJ}$

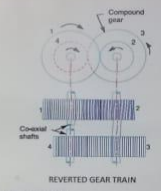
SUBMITTED TO :-
MR. PARVEEN SARSWAST
MRS. MONIKA KHURANA

SUBMITTED BY :-
JUSTIN VARGHISE
MUDIT GUPTA

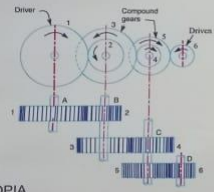
GEAR TRAINS



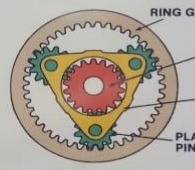
SIMPLE GEAR TRAIN



REVERTED GEAR TRAIN



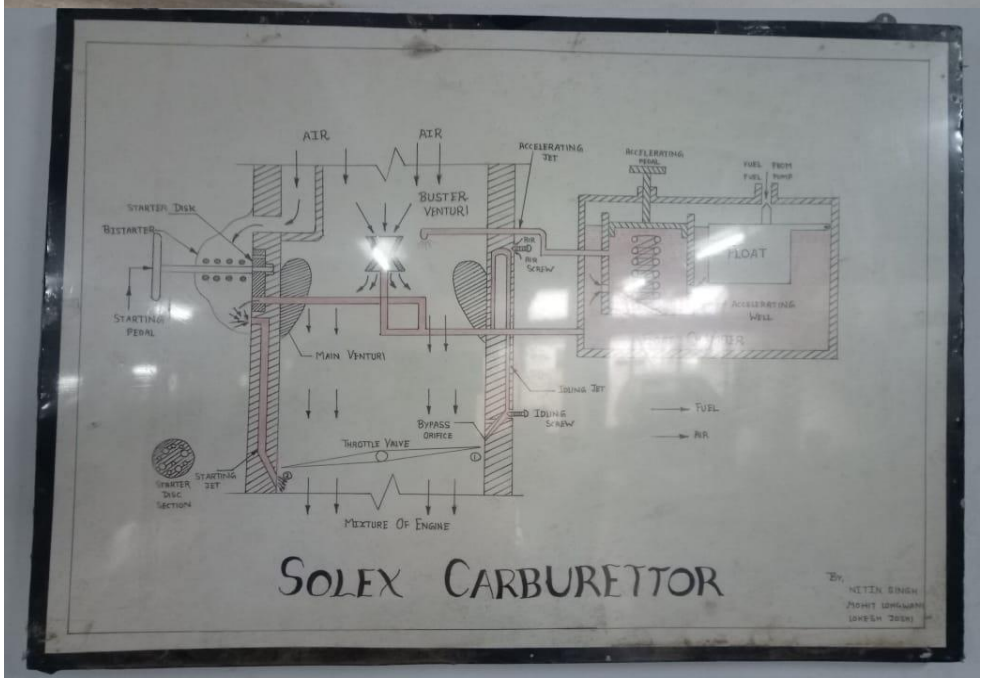
COMPOUND GEAR TRAIN



EPICYCLIC GEAR TRAIN

SUBMITTED TO
MR. AJAY DHANOPIA
MR. PRAMOD JAIN
TEC. MUKESH KUMAR

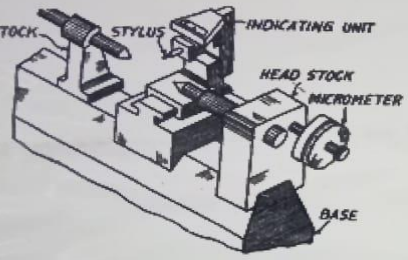
SUBMITTED BY
1 MANISH VIJAY
2 LALCHAND SHARMA
3 MAYANK JANGID
4 KANHIYALAL GARG

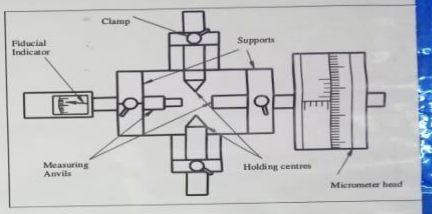


SOLEX CARBURETTOR

BY,
NITIN SINGH
MOHIT VARSHNEY
LOKESH JOSHI

BENCH MICROMETER

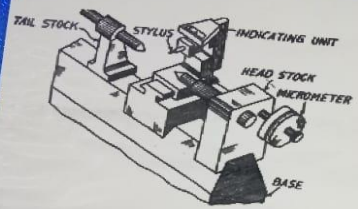


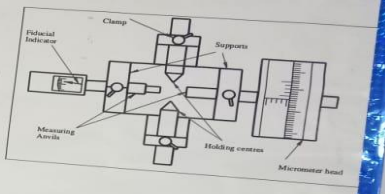


SUBMITTED TO:-
Mr. Praveen Saraswat
Mrs. Monika Khurana

SUBMITTED BY:-
Abhishek Gupta(01
Adarsh Singh(02)
SEC:- 'S'

BENCH MICROMETER





SUBMITTED TO:-
Mr. Praveen Saraswat
Mrs. Monika Khurana

SUBMITTED BY:-
Abhishek Gupta(01)
Adarsh Singh(02)
SEC:- 'S'

SINE BAR

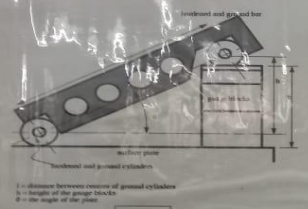


Fig. Checking of unknown angles of small components

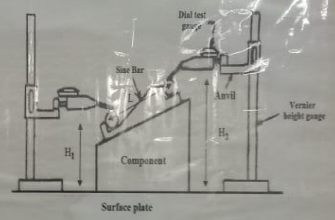
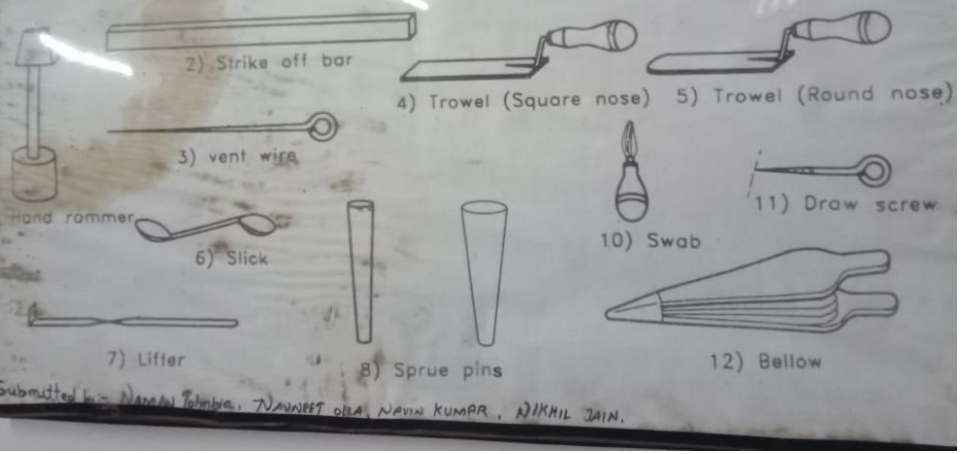


Fig. Checking of unknown angles of heavy components

Submitted to:
Mrs. MONIKA KHURANA
Mr. PRAVEEN SARASWAT

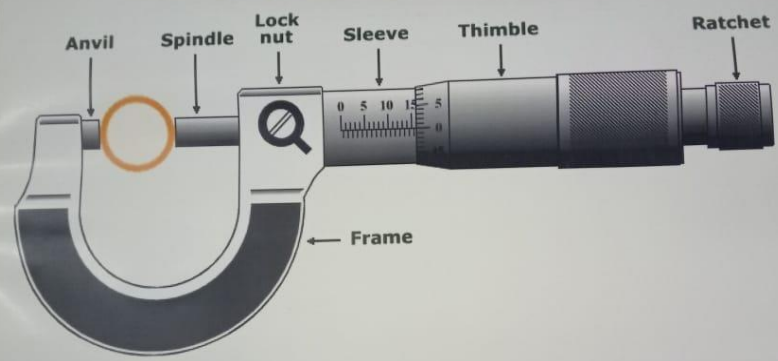
Submitted by:
VISHAL SHARMA
YOGESH SHARMA

Foundry Tools



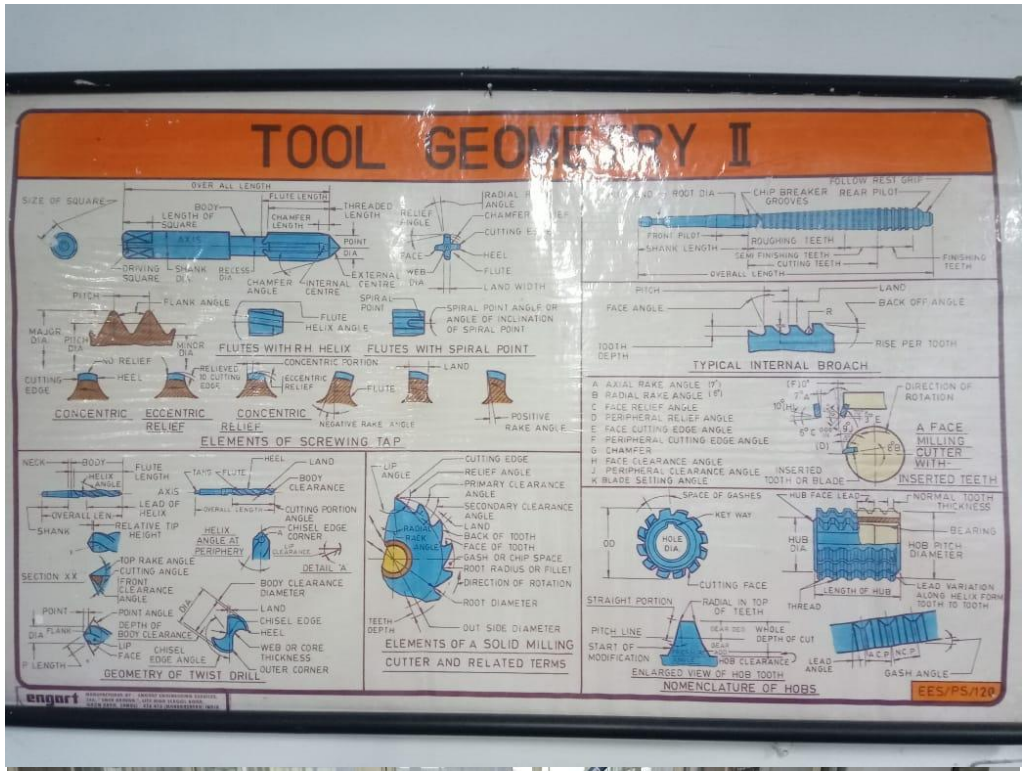
Submitted by:- Nawneet Dila, Navin Kumar, Nikhil Jain.

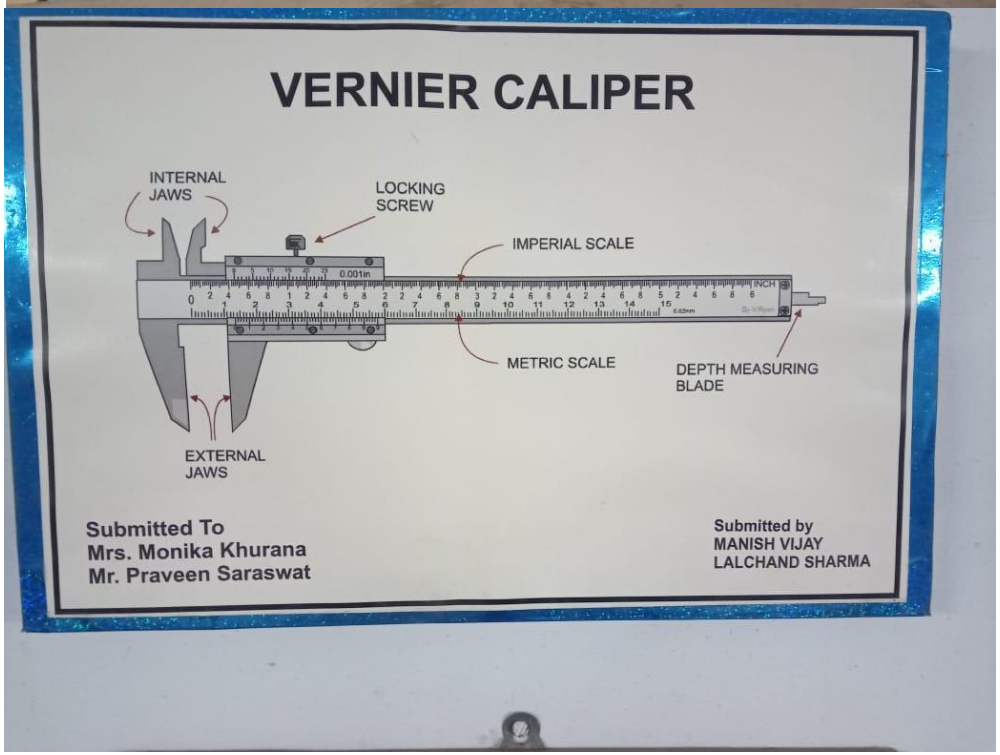
Micrometer



Submitted To
Mrs. Monika Khurana
Mr. Praveen Saraswat

Submitted by
Mayank Singh
Mehul Sharma


TOOL GEOMETRY II
ELEMENTS OF SCREWING TAP
GEOMETRY OF TWIST DRILL
ELEMENTS OF A SOLID MILLING CUTTER AND RELATED TERMS
TYPICAL INTERNAL BROACH
A FACE MILLING CUTTER WITH INSERTED TEETH
NOMENCLATURE OF HOBS
engart
EES/PS/120


VERNIER CALIPER
INTERNAL JAWS
LOCKING SCREW
IMPERIAL SCALE
METRIC SCALE
DEPTH MEASURING BLADE
EXTERNAL JAWS
Submitted To
Mrs. Monika Khurana
Mr. Praveen Saraswat
Submitted by
MANISH VIJAY
LALCHAND SHARMA


ROCKWELL & BRINELL HARDNESS MACHINE
ME - M3T - LAB


TORSION TESTING MACHINE


SPRING TESTING MACHINE


ME - M3T - LAB


POLISHER (DRY & WET TYPE)

SAFETY PRECAUTIONS TO BE FOLLOWED IN MECHANICAL WORKSHO

Major Shop Hazards

Burns:

- Hot materials and work piece from welding, torch cutting and heat-treat operations
- Welding radiation (similar to sunburn)
- Electric shock
- Eye Injuries
- Welding rays
- Chips from machining operations, broken tools
- Chemicals splashed in eyes, chemical fumes

Chemicals:

- Skin and eye contact
- Inhalation of toxic fumes
- Explosion/fire

Cuts, Abrasions:

- Sharp edges on stock or work piece
- Cutting tools
- Pinch points
- Chips from machining operations

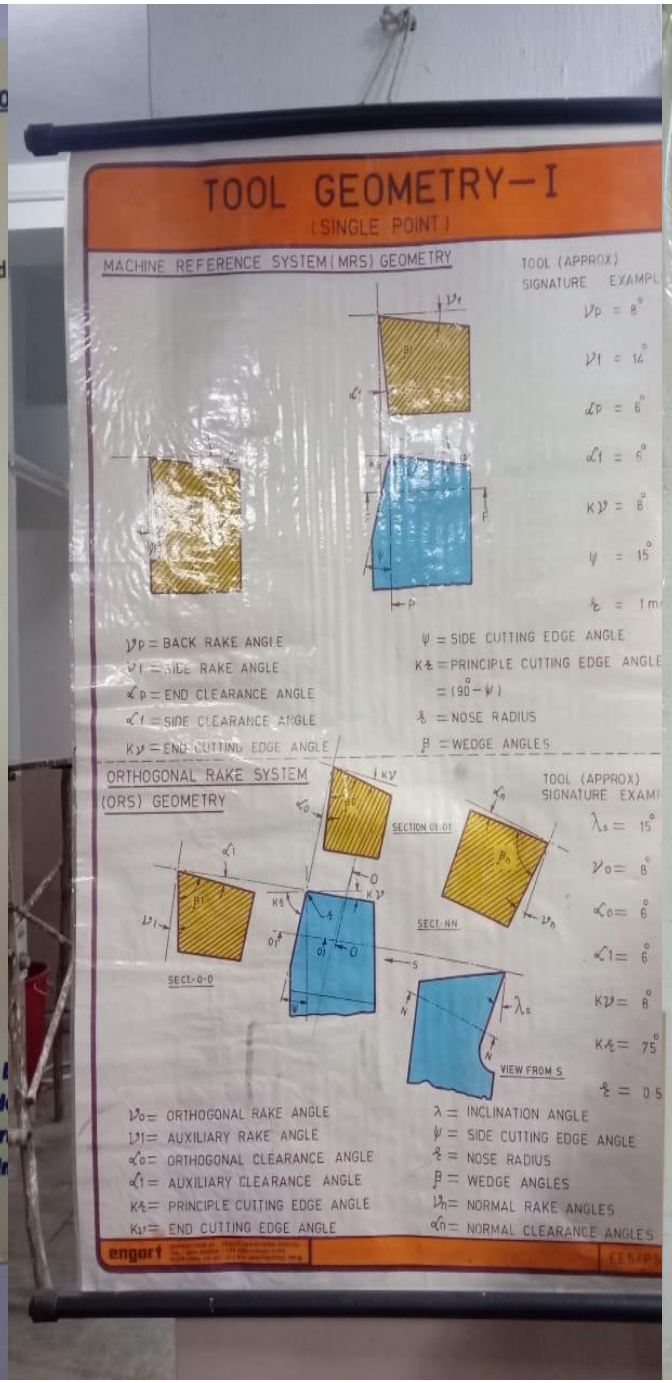
Slip and Fall Accidents

- Coolant and oil spills

Air hoses - cords - welding cables - cluttered work area

Submitted to-
Yogesh Kumar Sharma

Submitted b
Anop Mund
Ankur Shar
Arendra Sin
Ankit Sain



SAFETY PRECAUTIONS FOR MACHINE SHOP

- Safety Glasses must be worn at all times to prevent eyes from flying chips.
- Know how to stop the machine tool before you attempt to start the machine.
- Loose clothing, long hair, ties, personal stereo wires and jewelry may become entangled in rotating equipment leading to serious injury or death so remove or securely fastened to avoid entanglement.
- Do not touch Lathe tools by fingers as they can be extremely sharp & may get cut fingers severely.
- The chips produced in the lathe can also be razor sharp. Use extreme caution when removing lathe chips. Always use a brush to clean a machine. Do not use compressed air to blow the chips off of the machine.
- Never attempt to measure parts or clean the machine while the work piece is rotating.
- The spindle must be completely stopped before attempting to change from low gear to high gear or vice versa.
- Make certain that the work piece is securely clamped in the lathe chuck or face plate or table of machine.
- Before powering up spindle, make certain all loose hand tools such as chuck keys, wrenches and measuring tools have been removed from the machine and put in the proper location.
- Calculate the proper spindle speed and feed rate before beginning a cut.

Submitted to-
Yogesh Kumar Sharma

Submitted by-
Anop Mundel
Ankur Sharma
Arendra Singh
Ankit Sain

SIMO CHART

DRAWING NAME: 1 Bolt Washer Assembly
OPERATION: Assemble 2 Washers on Bolt

Wink counter Reading	Left Hand Description	Therblig	Time	Time in 2000/min	Time	Therblig	Right Hand Description
				0			
120	Reaches for Bolt	TE	12		12	TE	Reaches for Bolt
	Selects & Grasps bolt	STG	8	20	8	STG	Selects & Grasps bolt
140	Carries bolt to fixture	TL	16		16	TL	Carries bolt to fixture
160	Position bolt into fixture	P	20	40	20	P	Position bolt into fixture
180	Reaches for steel Washer	TE	12	60	12	TE	Reaches for steel Washer
	Selects & Grasps Washer	STG	8		8	STG	Selects & Grasps Washer
200	Carries Washer to Bolt	TL	16	80	16	TL	Carries Washer to Bolt
	Positions washer into Bolt	P	8		8	P	Positions washer into Bolt
220	Reaches for lock Washer	TE	12	100	12	TE	Reaches for lock Washer
	Selects Grasps lock Washer	STG	8		8	STG	Selects Grasps lock Washer
240	Carries lock washer to bolt	TL	16	120	16	TL	Carries lock washer to bolt
	Position lock washer to bolt	P	8		8	P	Position lock washer to bolt
260	Withdraw assembly from fixture	DA	20	140	20	DA	Withdraw assembly from fixture
280	Carry assembly to bin	TL	16	160	16	TL	Carry assembly to bin
				180			
300	Release assembly	RL	8	200	8	RL	Release assembly

Submitted to:-
Mr. Sunil Kumar Sharma
Lecturer
Deptt. of Mechanical Engg.

Submitted by:-
Batch : T-1, Sem : 4th, Year : 2009-10
1. Manish Modi
2. Manoj Kumar
3. Monu Gupta
4. Nishant Rana

EMPLOYEE-MACHINE ACTIVITY CHART

Cards read by an optical scanner	Product: Process:	Operator: DM. Charted by: U.C.
Employee Action	Time (in seconds)	Machine Action
	0	
Removes rubber band from deck of cards	2	Idle
Picks up weight from the hopper	4	Idle
Places deck in the hopper	6	Idle
Replaces weight on the deck	8	Idle
Pushes start button	10	Idle
Idle	12	Optical scanner reads the deck of cards
Idle	14	
Idle	16	
Idle	18	
Picks up deck from the output stacker	20	
Replaces rubber band on the deck	22	Idle

SUBMITTED TO:
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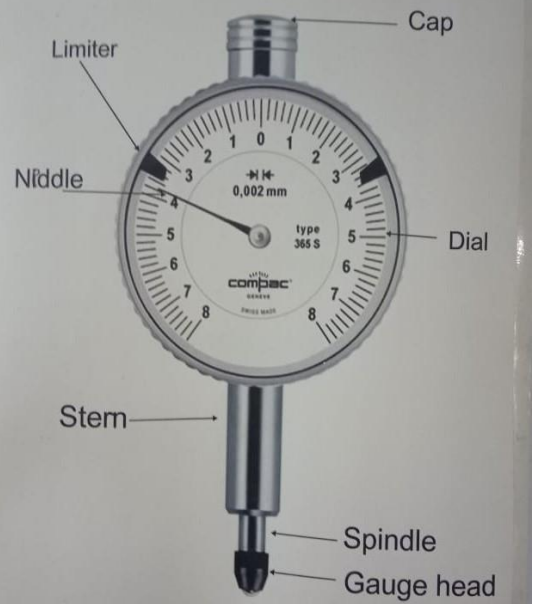
Mechanical Deptt.
SKIT, Jaipur

SUBMITTED BY:
Praveen Kumar (36)
Pushnendra Singh Bhati (37)
Rahul Chhabra (38)
Ravi Sharma (39)
Ravindra Singh Yadav (40)

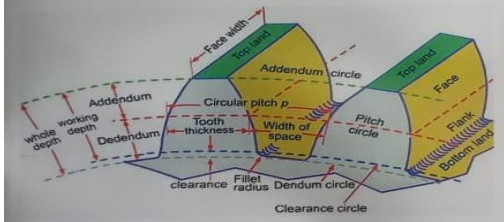
Dial Gauge



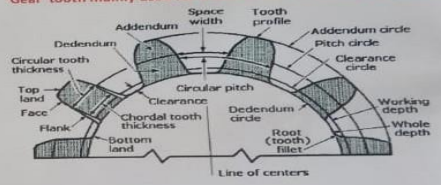
Submitted To
Mrs. Monika Khurana
Mr. Praveen Saraswat

Submitted by
Mayank Ranka
Mayank Jangid

Terminology of gear tooth



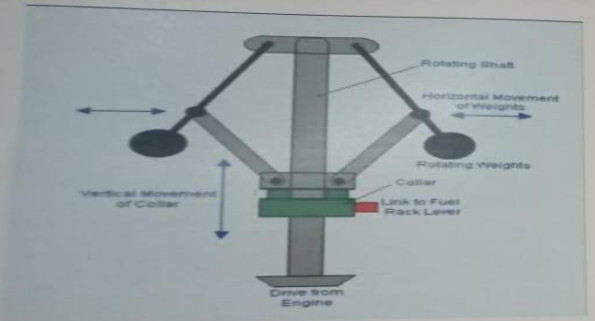
Gear tooth mainly used for transmission of power and motion.

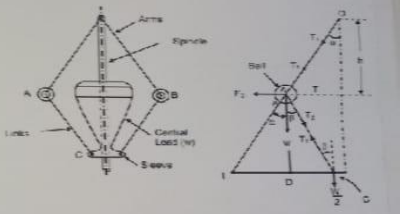


Submitted to
Mr. Ajay Dhanopia
Mr. Promod Jain
Tec. Mukesh Kumar

Submitted By
Himanshu Khandelwal
Jalak Bhatt
Justin Varghise
Kanhaiya Lal Jat

PORTER GOVERNOR





SUBMITTED TO.
MR. AJAY DHANOPIA SIR
MR. PRMOD JAIN SIR

SUBMITTED BY.
RAJAT JANGIR
RAJESH NITHARWAL
RAJNISH DOODI
RAVI RANJAN

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT AND GRAMOTHAN

Mechanical Workshop

Submitted to : Mr.SUDESH GARG

Some sheet metal shop tools

USED FOR MAKING INDENTATION MARKS FOR LOCATING CENTER POSITION FOR DIVIDERS. It HAS A TAPER ANGLE OF 30°

Prick punch

USED FOR MARKING THE LOCATION OF POINTS AND CENTERING HOLE TO BE DRILLED. IT HAS A TAPER ANGLE OF 90°

CENTER PUNCH

Blades are straight. *It is used to cut 22 SWG or lighter sheets along straight line.*

STRAIGHT SNIP

Blades are curved back from the cutting edges; *it is used to cut discs and round articles from sheets.*

BENT SNIP

These are *used for cutting sheets, rivets and bolts.*

CHISELS

Hammers are used for bending of sheets, smoothening of sheets, locking of joints and riveting work

(a) General purpose, face is slightly curved, and head is round

BALL PEEN HAMMER

(b) It has square flat face, used for flattening of seams.

SQUARE FACE HAMMER

(a) Made of good quality of wood or plastic used whenever light force is required

MALLET

Available in different sizes. It could be steel foot rule, folding, ... or tape rule.

STEEL RULE

It is a steel wire, with one end sharp and hardened *to make lines on metallic sheet*

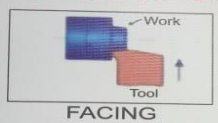
SCRIBERS

It is L-shaped piece of hardened steel, used to make square corners, checking and marking right angles.

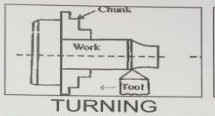
STEEL SQUARE

SKIT - JAIPUR

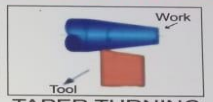
OPERATIONS OF CENTRE LATHE MACHINE



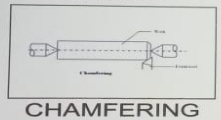
FACING

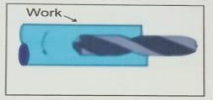


TURNING



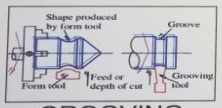
TAPER TURNING


CHAMFERING

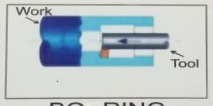


DRILLING

KNURLING



GROOVING

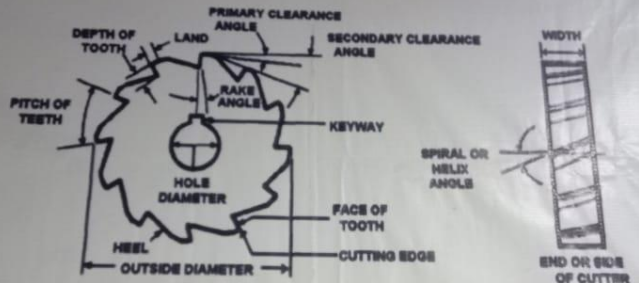


BO RING

THREADING

SUBMITTED BY:
GROUP -G2
HARISH KUMAR - 43
HAR SH VARDHAN SINGH CHUNDAWAT - 44
HIMANSHU GOYAL - 45
HIMANSHU PARMAR - 46

Geometry of Plane Milling Cutter



Submitted to:
Mr. Yogesh Sharma

Submitted by:
Amit Agrawal
Anay Mathur
Aman Rawat
Anirudh Singh

SINE BAR

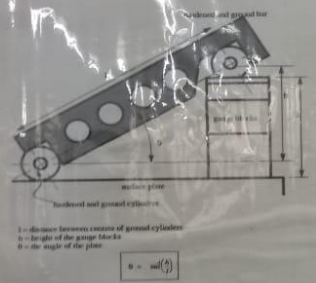


Fig. Checking of unknown angles of small components

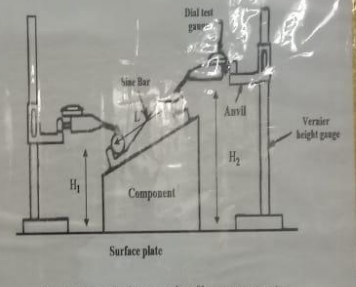


Fig. Checking of unknown angles of heavy components

Submitted to:
Mrs. MONIKA KHURANA
Mr. PRAVEEN SARASWAT

Submitted by:
VISHAL SHARMA
YOGESH SHARMA

PLUG GAUGE & SNAP GAUGE

Submitted To
Mrs. Monika Khurana
Mr. Parveen Saraswat

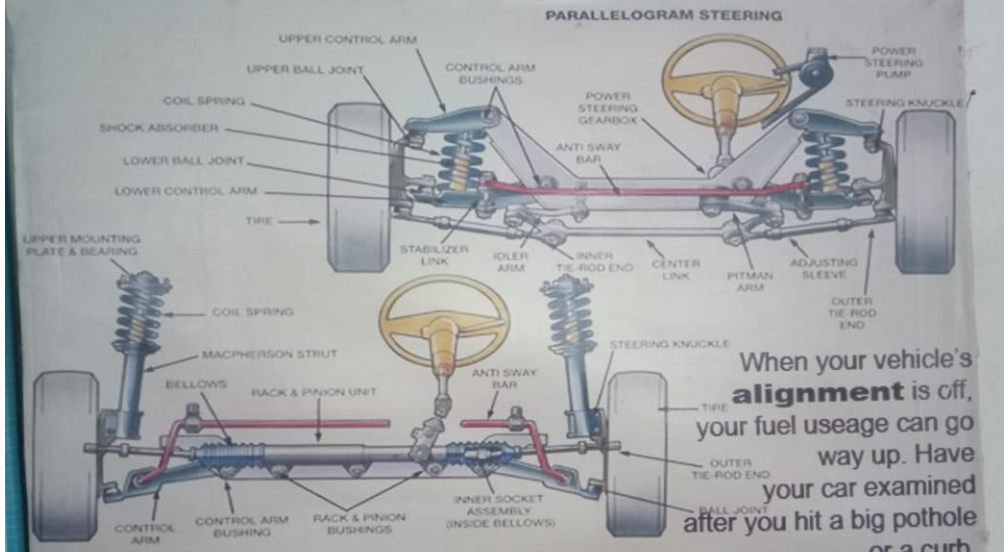
Submitted By
Rahul Tyagi
Saksham Mathur

TYPES OF Welding Joints

BUTT JOINTS	SQUARE	OPEN	WELDING BOTH SIDES	SINGLE V	DOUBLE V	SINGLE BEVEL	DOUBLE BEVEL	SINGLE J
CORNER JOINTS	SINGLE V		SINGLE V AND FILLET		SINGLE FILLET			
EDGE JOINTS	SQUARE				SINGLE V			
LAP JOINTS	SINGLE FILLET				DOUBLE FILLET			
TEE JOINTS	DOUBLE FILLET		SINGLE FILLET		DOUBLE BEVEL		DOUBLE J	

MADE BY : JYOTI YADAV, JAGMOHAN, JITENDRA, HIMANK, HARSHITA, JAIPRAKASH, HIMMAT, HARENDRA, HITESH MENANI, HITESH JAIN.

PARALLELOGRAM STEERING



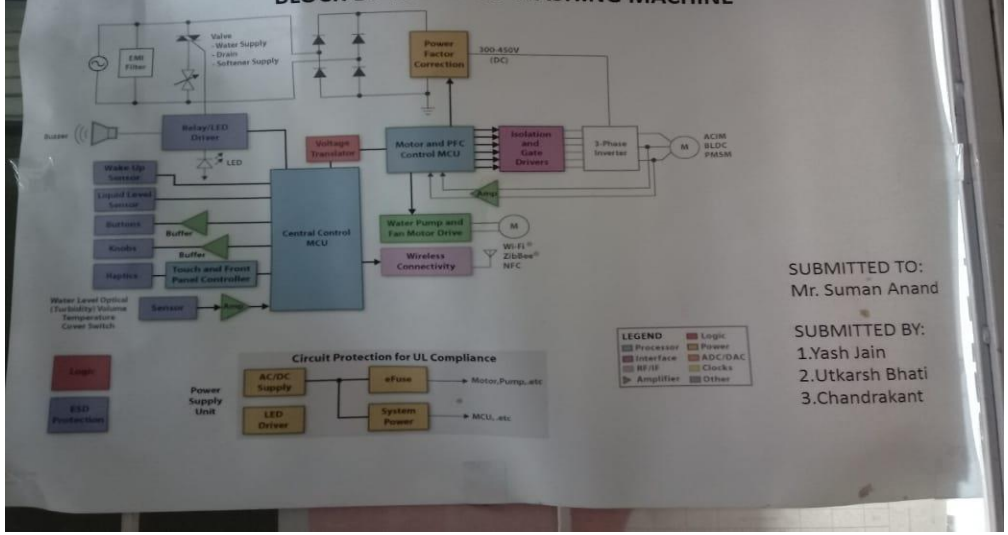
RACK & PINION STEERING

When your vehicle's **alignment** is off, your fuel useage can go way up. Have your car examined after you hit a big pothole or a curb.

Submitted by:
Hozefa Hussain
Jai Rawal

Submitted by:
Jaspreet Singh
Jatin Vijay

BLOCK DIAGRAM OF WASHING MACHINE

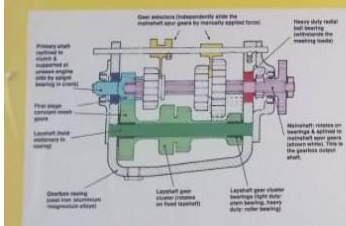


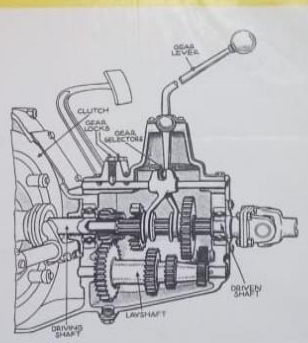
SUBMITTED TO:
Mr. Suman Anand

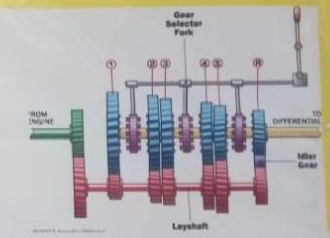
SUBMITTED BY:
1.Yash Jain
2.Utkarsh Bhati
3.Chandrakant

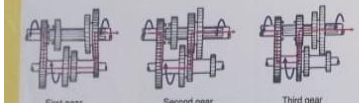
SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT & GRAMOTHAN, JAIPUR

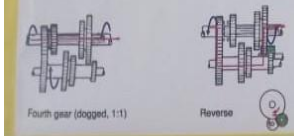
FOUR STEP SLIDING MESH GEAR BOX











CONSTANT MESH G.B

Submitted by:-

Mrinal Mathur(15ESKM109)

Naman Pathak(15ESKME111)

Narendra Bhandari(15ESKME112)

Narendra Singh(15ESKME113)

Submitted to:-

Mr. Pramod Jain (Assistant Prof.)

SKIT, Jaipur

TYPES OF GEARS

SPUR

PARALLEL SHAFT AND STRAIGHT TEETH

HELICAL

PARALLEL SHAFT AND CURVED TEETH

HERRINGBONE

PARALLEL SHAFT AND DOUBLE HELICAL

SPIRAL BEVEL

Submitted To
Mr. Ajay Dhanopia
Mr. Pramod Jain
Mr. Mukesh Kumar

WORM

SKEW SHAFTS

RACK & PINION

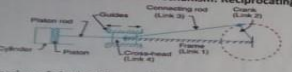
Submitted By
Mayank Ranka
Mayank Singh
Mehul Sharma

SWAMI KESVANAND INSTITUTE OF TECHNOLOGY MANAGEMENT & GRAMOTHAN, JAIPUR

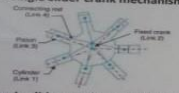
FOUR BAR CHAIN INVERSION

Inversion of single slider crank mechanism

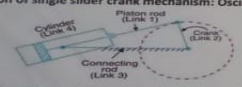
I. First inversion of single slider crank mechanism: Reciprocating Engine



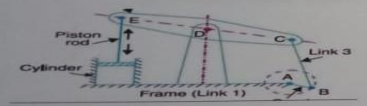
II. Second inversion of single slider crank mechanism: Rotary Engine



III. Third inversion of single slider crank mechanism: Oscillating Engine

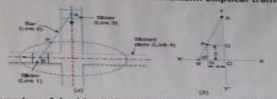


IV. Fourth inversion of single slider crank mechanism: Beam Engine

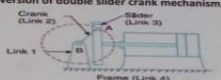


Inversion of double slider crank mechanism

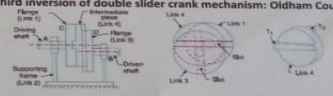
I. First inversion of double slider crank mechanism: Elliptical trammel



II. Second inversion of double slider crank mechanism: Scotch Yoke



III. Third inversion of double slider crank mechanism: Oldham Coupling



Submitted By: (i) Chandan Kumar (16ESKME045)
(ii) Chinmay Trivedi(16ESKME046)
(iii) Darsh Jain (16ESKME047)
(iv) Darshan Kumar (16ESKME048)

Submitted To : Mr. Pramod Jain (Assistant Prof.) , SKIT Jaipur.

SKIT

असतो मा सद्गमय

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT & GRAMOTHAN, JAIPUR

LIGHTING SUGGESTIONS

- Remember to switch OFF the lights and electrical items when you leave the laboratory.
- If you see an empty laboratory, with the lights ON, please turn them OFF.
- Avoid unnecessary lighting, like in an unoccupied room or when there is sufficient sunlight.
- Promote LED lighting because not only they are energy efficient, they can be tuned more easily to specific wavelengths.

- Take advantage of natural lighting, which has positive effects on well being.
- Light personal desks/working space rather than whole room where possible.
- Turn OFF any electrical item whenever not required, such as electrical motor and lights, as well as computer equipment and analytical equipment.

Submitted to-
Mr. Pramod Jain
Asst. Professor
Dept. of Mechanical Engg.

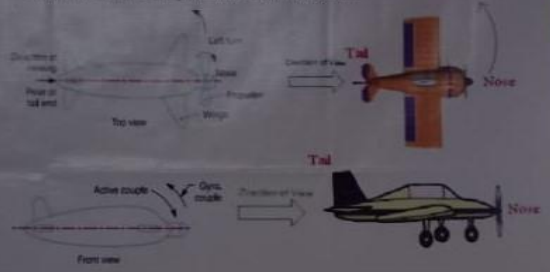
Submitted by-
Gaurav Gupta (16ESKME301)
Abhishek Pradhan (16ESKME302)
Pulkit Jain (16ESKME303)

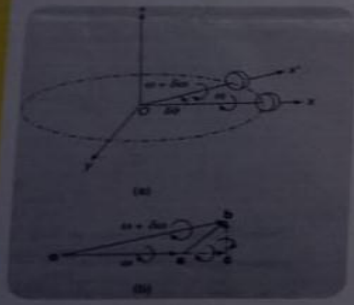
SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, MANAGEMENT & GRAMOTHAN, JAIPUR

GYROSCOPE

Effect of the Gyroscopic Couple on an Aero-plane

- The top and front view of an aero-plane are shown in Fig.
- Let engine or propeller rotates in the clockwise direction when seen from the rear or tail end and the aero-plane takes a turn to the left.





Gyro Torque = Angular Momentum x Angular Velocity

$$\tau = I_{spin} \times \omega_{spin} \times \omega_{prec} \text{ [Nm]}$$

where,

τ is the gyro torque [Nm]

I_{spin} is the flywheel rotational moment of inertia about the spin axis [kg.m^2]

ω_{spin} is the spin speed or spin angular velocity [rad.s^{-1}]

ω_{prec} is the precession angular velocity or precession rate [rad.s^{-1}]

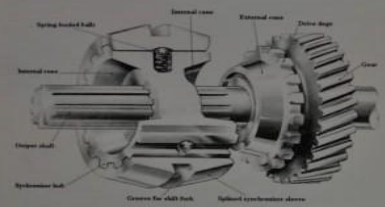
Submitted By:-

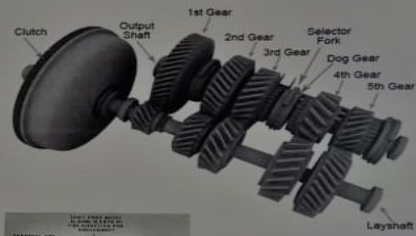
Navdeep Singh Nathawat (15ESKME114)
Nitin Lamoria (15ESKME117)
Nitin Mishra (15ESKME118)
Nitin Pareek (15ESKME119)

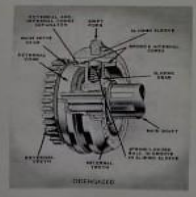
Submitted to:-

Mr. Pramod Jain (Assistant Prof.)
SKIT, Jaipur

Synchromesh Gear Box







SUBMITTED TO :-

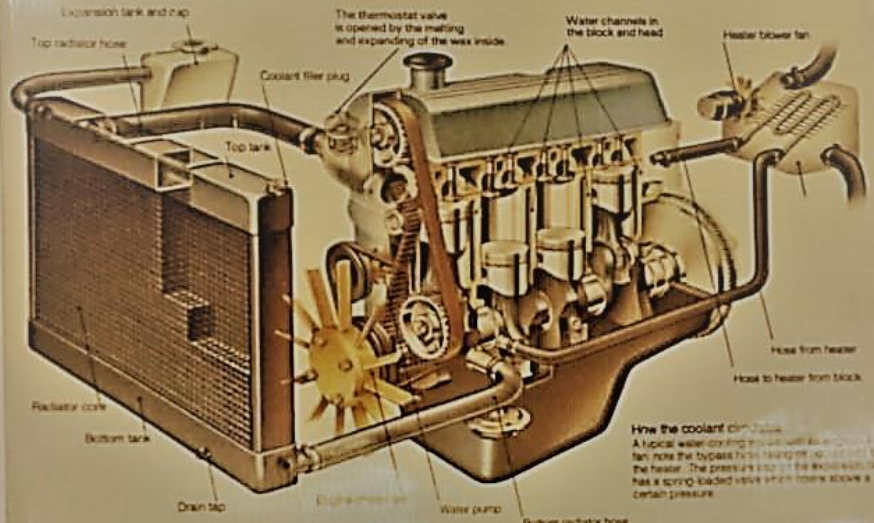
AJAY DHANOPIA SIR
Mr. PRAMOD JAIN
Tec. Mr MUKESH KUMAR

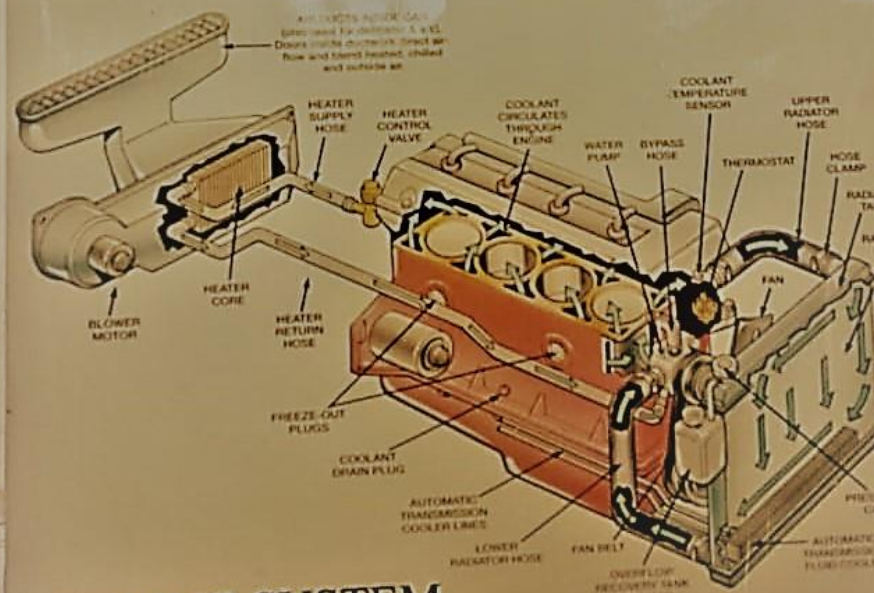
SUBMITTED BY :-

AMOL DHUPAR
ANKIT SOLANKI
ANSHUL TAILOR
ANSHUMAN SINGH JADOUN

SWAMI KESHVANAND INSTITUTE OF TECHNOLOGY, JAIPUR

DEPARTMENT OF MECHANICAL ENGINEERING





COOLING SYSTEM

Submitted By: Rahul Bagla, Rahul Garg
Batch: B1
Faculty Name: Aashish Nayak, Chandan K. Gupta

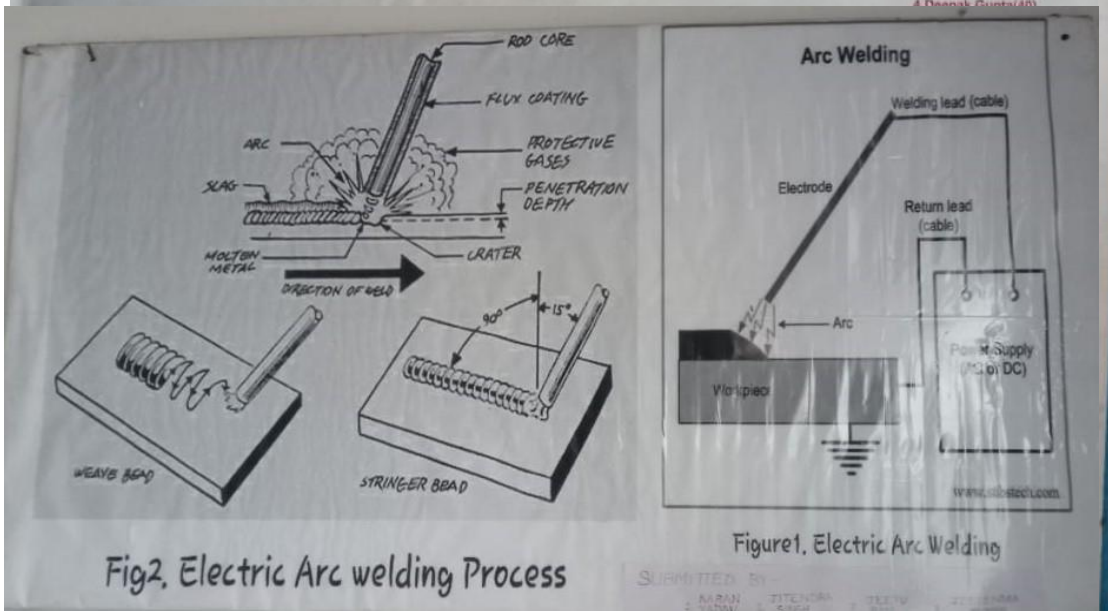
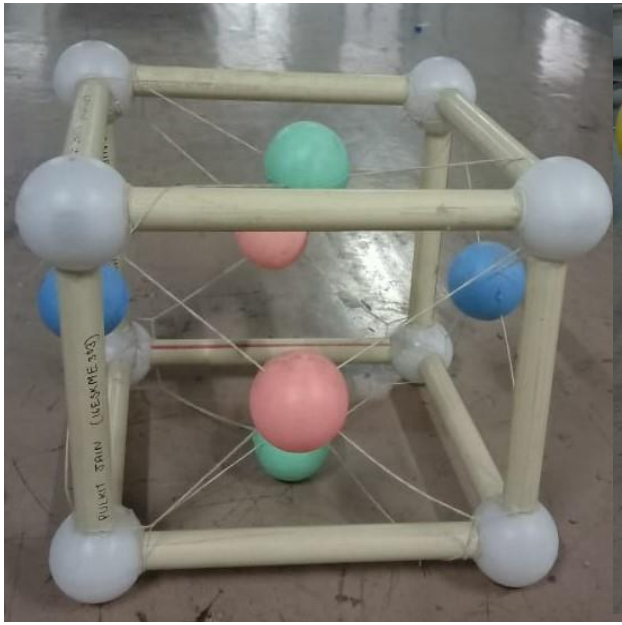
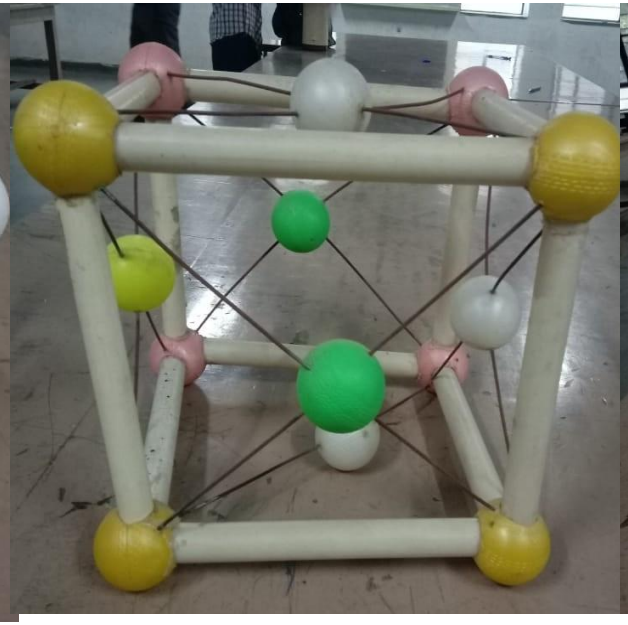


Fig2. Electric Arc welding Process

Figure1. Electric Arc Welding

Name	Roll No.
Abhishek Saharan	7
Abhishek Sharma	8
Abhishek Sihag	9
Abu khurram	10
Adarsh Lokanda	11
Aditya Choudhary	12






Abhishek Anand
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