

MECHANICAL MAINTENANCE ENTRY ENABLING OBJECTIVES

MATHEMATICS

CALCULATE the areas of various geometric figures

PERFORM measurements of various figures

PERFORM conversions between SI and METRIC systems

PERFORM measurement accuracy calculations

ENGINEERING DRAWING

DEFINE lines and their usages on Engineering Drawings

DESCRIBE various symbols used in Engineering Drawings

TOOLS

DEFINE different tools categories and their uses

DESCRIBE the following types of hand tools

- a. Lineman pliers
- b. Needle Nose Pliers
- c. Phillips/Straight slotted Screwdrivers
- d. Groove-Joint pliers (Slip Joint)
- e. Ball Peen /Carpenter Hammers
- f. Levels and Carpenter Squares
- g. Ratchet/Socket usage (SI and METRIC)
- h. Awls, Punches, and Scribes
- i. Measuring devices (Calipers, Torque Wrenches, Rulers)

DESCRIBE the following types of power hand tools

- a. Reciprocating Saws
- b. Electric Drills
- c. Saber Saws
- d. Circular Saws
- e. Pneumatic Drills

PNEUMATICS

DEFINE fluid flow and what affects its rate

DEFINE friction and its causes

PNEUMATICS (Continued)

DEFINE the following terms:

- a. Volume
- b. Specific Gravity
- c. Specific Volume
- d. Kinetic Energy
- e. Velocity
- f. Weight
- g. inertia
- h. dew point

DISCUSS the following various equipment components of pneumatic systems:

- a. Actuators
- b. Air Tank
- c. Control Valves
- d. Motors
- e. Regulators
- f. Cylinder Accessories

DESCRIBE the various symbols that represent various components

DESCRIBE different nozzle configurations

DISCUSS the different hazards and contaminants that affect pneumatic systems

BEARINGS

DEFINE the function of a bearing

LIST the different classifications of anti-friction bearings

DESCRIBE the components of anti-friction bearings

DESCRIBE the affects and usage of lubrication

DESCRIBE the loading imposed on the following bearing types

- a. Radial Bearings
- b. Axial Bearings
- c. Roller Bearings (Convex)
- d. Thrust Bearings

HYDRAULICS

DESCRIBE fluid flow and the forces involves

HYDRAULICS (Continued)

LIST the basic components of a hydraulic system

DESCRIBE the use of a check valve in a hydraulic system

DISCUSS the use of valves for the control of single acting cylinders

DISCUSS the use of valves for the control of double acting cylinders and bidirectional motors

DISCUSS the different types of hydraulic pumps

DISCUSS the different safety related parts of a hydraulic system.

ALIGNMENT/COUPLINGS

DESCRIBE the different types of misalignment problems

DESCRIBE the safety precautions to employ when working on shafts and couplers

BELTS AND CHAIN DRIVES

LIST the different types of belt shapes

LIST the different types of sheaves associated with belts

CALCULATE the values between Drive Sheaves and Driven Sheaves

DESCRIBE the set up requirements when aligning and using belt drives

LIST the different types of chain drive systems

DESCRIBE chain set-up and inspection requirements

GEARS

LIST the different types of gear configurations for parallel, straight, and perpendicular shaft alignments

DEFINE pitch

DEFINE gear set general rule

LIST the common causes of gear failure.

PUMPS

DESCRIBE the various parts of a pump and their purpose.

DEFINE the following terms

- a. cavitation
- b. variable frequency drive (VFD)
- c. volute
- d. impeller
- e. stage
- f. casing

LIST the different types of pumps and their usage

INCIDENTAL RIGGING

DESCRIBE the requirements for the inspection of rigging equipment

DEFINE working load limit (WLL) and safe working load (SWL)

DISCUSS the failure criteria for all types of slings

LADDERS AND SCAFFOLDS

DISCUSS the safety requirements for the following types of ladders

- a. Stepladders
- b. Straight and Extension
- c. Safety Platform Ladders

DISCUSS the proper ladder for electrical work

DESCRIBE the safety requirements for the use of scaffolds

FASTENERS

DEFINE thread pitch

IDENTIFY the fastener classification and meaning of letters and numbers

DESCRIBE the different types of fasteners and their use.

COMPRESSORS/FANS/BLOWERS

DISCUSS the following basic gas laws:

- a. Boyles Law
- b. Charles' Law
- c. Guy-Lussac's Law
- d. General Gas Law

LIST the basic components of Compressors/Fans/Blowers

DESCRIBE turbulent air flow

LIST the basic types of air compressors

THERMODYNAMICS

DEFINE the following terms:

- a. Latent Heat
- b. Specific Gravity
- c. First law of Thermodynamics
- d. Conservation of Energy

CALCULATE between Celsius and Fahrenheit degrees

CALCULATE heat removal from a heat source (Given the equations)

HEAT EXCHANGERS/CONDENSORS

LIST the two types of air-cooled condensers

LIST the different parts of condensers and their purpose (Air and Water Cooled)

LIST the different types of heat exchangers.

STEAM/STEAM TRAPS

DEFINE the following terms

- a. Saturation point
- b. enthalpy
- c. heat capacity
- d. superheated steam
- e. wet steam
- f. steam trap
- g. thermodynamic steam trap
- h. condensate

LUBRICATION

DEFINE the following terms:

- a. viscosity
- b. full film lubrication
- c. density
- d. coalescing

DISCUSS the advantages of pressure lubrication

DISCUSS the advantages of Grease Lubrication over Oil Lubrication

FILTERS/STRAINERS

DISCUSS the different classifications of filters

PIPEFITTING/BASIC PLUMBING

DESCRIBE the requirements for bending pipe

DISCUSS the different types of fittings

LIST the three basic types of connections

GASKETS/PACKING/SEALS

DESCRIBE the purpose of a gasket

LIST the different types of gaskets and their usage.

LIST the different types of packing

LIST the different types of seals

OXY/ACETYLENE

DESCRIBE the different types of gas bottles or cylinders.

DESCRIBE the function of the regulator in a gas system

DISCUSS the basic safety precautions when using OXY/ACETYLENE

VALVES

LIST the basic components of valves

DESCRIBE the different types of valves and their usage.

DESCRIBE the marking found on valves