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MIDTERM TEST OF THE ODD SEMESTER
ACADEMIC YEAR 2020 / 2021

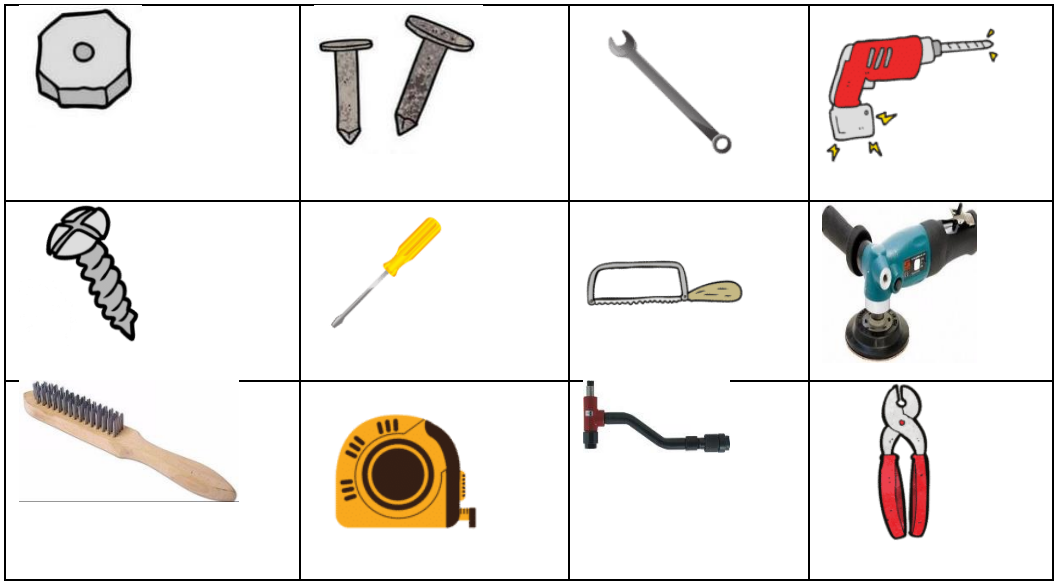
Course	: Bahasa Inggris
Lecturer	: Widya Ratna Kusumaningrum, M.Ed., M.Pd.
Credits/ Semester	: 2 / 1
Class	: (1,2,3)
Day, Date	: -
Time	: -
Study Program	: Mechanical Engineering

INSTRUCTIONS

1. Students are NOT allowed to access mobile phones, or any e-devices.
2. Students who do cheating, plagiarism, copying and pasting from Internet will get **ZERO score.**

Answer the following questions accordingly

1. Mention the names of the following pictures and explain each function of the items. (60points: each correct name and function is worth 5points)



2. Read the following text and point out the important points of view. **(40points)**

Moment of Force

Engineering design calculations nearly always use classical (Newtonian) mechanics. In classical mechanics, the concept of a `force' is based on experimental observations that everything in the universe seems to have a preferred configuration – masses appear to attract each other; objects with opposite charges attract one another; magnets can repel or attract one another; you are probably repelled by your professor. But we don't really know *why* this is (except perhaps the last one).

The idea of a *force* is introduced to quantify the tendency of objects to move towards their preferred configuration. If objects accelerate very quickly towards their preferred configuration, then we say that there's a big force acting on them. If they don't move (or move at constant velocity), then there is no force. We can't see a force; we can only deduce its existence by observing its effect. Specifically, forces are defined through Newton's laws of motion

When analyzing forces in a structure or machine, it is conventional to classify forces as *external forces; constraint forces* or *internal forces*.

External forces arise from interaction between the system of interest and its surroundings. Examples of external forces include gravitational forces; lift or drag forces arising from wind loading; electrostatic and electromagnetic forces; and buoyancy forces; among others. Force laws governing these effects are listed later in this section.

Constraint forces are exerted by one part of a structure on another, through joints, connections or contacts between components. Constraint forces are very complex, and will be discussed in detail in Section 8.

Internal forces are forces that act inside a solid part of a structure or component. For example, a stretched rope has a *tension force* acting inside it, holding the rope together. Most solid objects contain very complex distributions of internal force. These internal forces ultimately lead to structural failure, and also cause the structure to deform. The purpose of calculating forces in a structure or component is usually to deduce the internal forces, so as to be able to design stiff, lightweight and strong components. We will not, unfortunately, be able to develop a full theory of internal forces in this course – a proper discussion requires understanding of partial differential equations, as well as vector and tensor calculus. However, a brief discussion of internal forces in *slender members* will be provided later.

- Good Luck –

-If opportunity does not knock, build a door-