



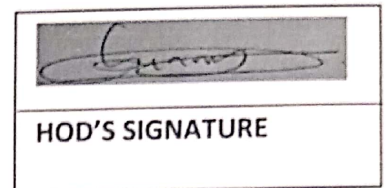
ELIZADE UNIVERSITY, ILARA-MOKIN,
ONDO STATE, NIGERIA

DEPARTMENT OF MECHANICAL
ENGINEERING

FIRST SEMESTER EXAMINATIONS

2019/2020 ACADEMIC SESSION

COURSE: MEE 509 – Tribology (2 Units)
CLASS: 500 Level Mechanical Engineering
TIME ALLOWED: 2 Hours
INSTRUCTIONS: Answer any **FOUR** questions



Date: February, 2020

Question 1 (15 Marks)

- a. Differentiate between Hydrodynamic bearings and Hydrostatic bearings.
- b. Write short notes on *four* types of Lubricants.
- c. Explain briefly the term “hydrodynamic lubrication”.

Question 2 (15 Marks)

- a. Differentiate between boundary lubrication and hydrodynamic lubrication
- b. How would you describe the lubrication of Internal combustion engines?
- c. Why are synthetic hydrocarbons considered so important nowadays in the preparation of lubricants?

Question 3 (15 Marks)

- a. Friction is a phenomenon caused by various reasons, with the aid of a sketch, discuss two causes of friction.
- b. Explain the following terms
 - a. Kinetic friction
 - b. Static friction
 - c. Wear
- c. Friction can be advantageous to mankind. Explain with two clear circumstances.

Question 4 (15 Marks)

- a. Define the following;
 - i. Adhesive wear
 - ii. Boundary Lubrication

- iii. Mixed Film Lubrication
- b. Vegetable based oils are fast becoming an acceptable alternative to soluble oils. Discuss.
- c. Explain briefly the following synthetic lubricants:
 - i. Polyalphaolefins
 - ii. Polyglycols
 - iii. Ester Oils
 - iv. Silicones

Question 5 (15 Marks)

- a. What are the criteria for a lubricant to be considered effective?
- b. Explain briefly the following Lubrication methods:
 - i. Oil Bath
 - ii. Oil-Splash
 - iii. Circulating Oil
 - iv. Oil-Mist
- c. Discuss the effect of Boric Acid, Phenol and Alcohol in soluble oil as a lubricant.

Question 6 (15 Marks)

- a. Discuss 5 properties of Lubricants you know.
- b. Explain briefly the term "Surface Roughness"
- c. A wooden pallet weighing 500 kg rests on a floor as seen in Figure 1, if the coefficient of friction acting on the pallet is 0.28, determine the normal force of the floor N pushing up in kilonewton.
- d. List 5 (five) Differences between Paraffinic Oils and Aromatic Oils.

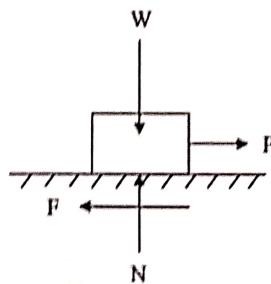


Figure 1