Experiment Details

Department Name	Mechanical
Class	S.Y B.Tech
Semester	Third Semester
Subject Name	Thermal Science
Experiment No.	1
Experiment Name	Experiment on Carbon Residue Apparatus.

Version History

Sr. No.	Version Number	Created By	Approved By	Date
1	v1.0	Akash Salunkhe	Mr. Rohit Ghulanavar	12/10/2020

AIM:

To determine the percentages of carbon residue after evaporation of oil.

THEORY:

Carbon residue term is used to designate the carbonaceous residue formed during evaporation & pyrolysis of petroleum product.

This residue is not entirely of carbon is but a coke which can further changed by residue is called carbon residue.

PRE TEST:

1) Lubricating oil
   a) Minimizes wear in moving parts
   b) Helps in keeping the parts cool
   c) Washes away and carries away dirt
   d) All of the above - Ans

2) Viscosity index is a measure for the change of viscosity with change in
   a) Temperature - Ans
   b) Pressure
   c) Volume
   d) All of the above

3) The following type of Lubrication system is used in Aircraft Engines
   a) Mist lubrication system
   b) Wet sump system
   c) Dry sump system - Ans
   d) Splash system

4) Which of the following statements is true about viscosity?
   a) Dynamic viscosity is the ratio of shear stress to the resultant shear rate.
   b) Kinematic viscosity is equal to dynamic viscosity divided by density.
   c) The CGS unit of dynamic viscosity is Centipoise and CGS unit of kinematic viscosity is Centistokes.
   d) All of above. - Ans

5) In 20 W 40, what does number 40 indicate?
   a) Winter viscosity index of oil.
   b) Summer viscosity index of oil. -Ans
   c) Weight of oil.
   d) Weight density of oil.

PROCEDURE:

1) Note the weight of the empty bulb (W1).
2) Select the type of engine oil.
3) Note the weight of the bulb with the engine oil.
4) Run the simulation.
5) Wait for bulb to return to its position.
6) Note the weight of the bulb with carbon residue.
7) Calculate the percentage of carbon residue by using formula % carbon residue = $\frac{A}{W}$ X 100 .

Where

A = A1 - W1 (carbon residue in gms)

W = W2 - W1 (wt. of sample in gms)

8) Enter the calculated % carbon residue in the block in front of the formula and check whether it is correct or not.

POST TEST:

1) Carbon residue of an oil is determined by
   a) By Conradson method only
   b) By Ramsbottom method only
   c) Either by Conradson or Ramsbottom method - Ans
   d) By Pensky-Martens (closed) method.

2) Carbon residue in diesel oil should not be more than
   a) 1%
   b) 0.5%
   c) 0.1% - Ans
   d) 0.01%

3) Viscosity of multi-grade oils
   a) Reduces with temperature but at higher sensitivity compare to mono-grade oil.
   b) Increases with temperature but at higher sensitivity compare to mono-grade oil.
   c) Reduces with temperature but at lower sensitivity compare to mono-grade oil. - Ans
   d) Increases with temperature but at lower sensitivity compare to mono-grade oil.

4) Which one is the common system for oil classification?
   a) SAE (Society of Automobile Engineers).
   b) API (American Petroleum Institute).
   c) ISO (International Organization for Standardization).
   d) All of the above. - Ans

5) Which of the following is/are the constituents of grease?
   a) Base oil.
   b) Additive.
   c) Thickness fiber.
   d) All of above. - Ans

REFERENCES:

Google Drive link:

Experiment on carbon residue (Thermal Engg. Lab Folder)
https://drive.google.com/drive/folders/1LsUqxm2hCArjGN5-IcbNMCX-_JqXLW3K?usp=sharing

Please see the attached documents with mail for more information.