



College of Engineering & Technology

Department: Mechanical Engineering

Marks: 15

Lecturer: Dr. Rola Afify

Time: 11:00 – 12:00

Course Code: ME361

Date: 15/7/2015

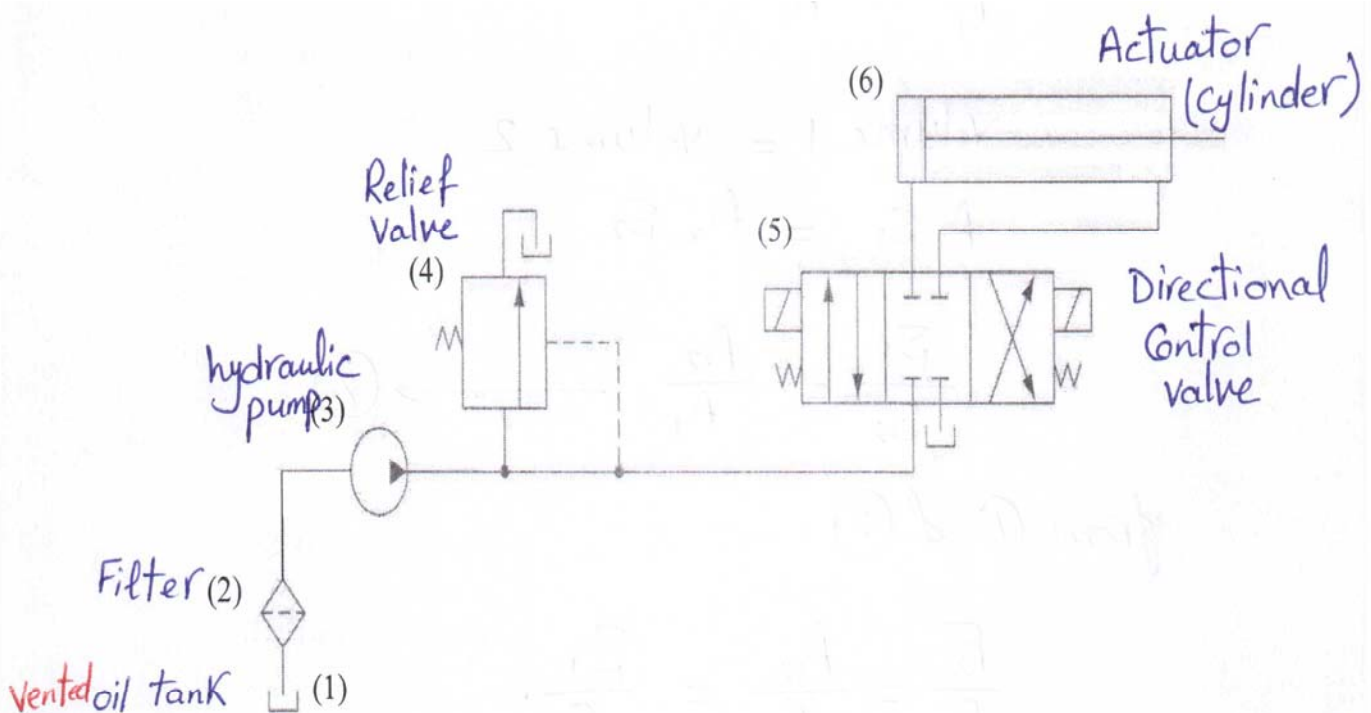
Name: **Model Answer**

R.N.:

Answer the following questions:

Question one (3 marks)

Write the name of each component in the following Hydraulic circuit

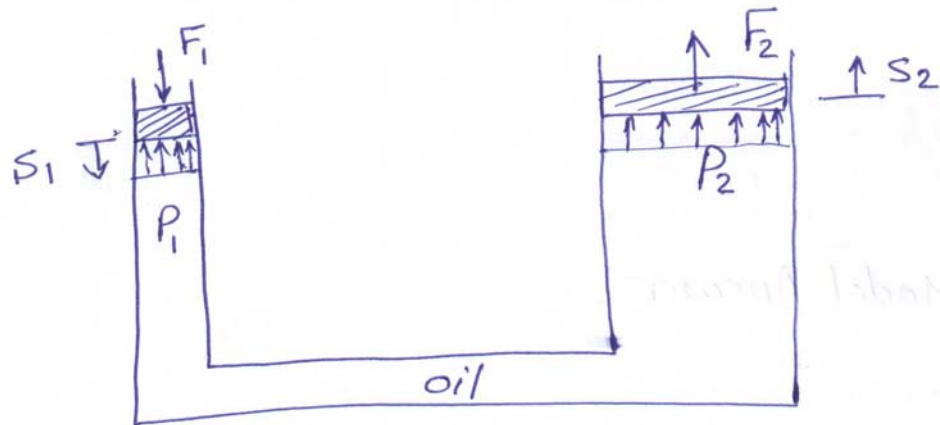


Question three (1 marks)

Does a Hydraulic Jack produce More Energy than it receives?

No, The energy input to the hydraulic jack equals the energy output from the jack.

Prove →



$$P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$\frac{F_2}{F_1} = \frac{A_2}{A_1} \longrightarrow \textcircled{1}$$

Volume 1 = Volume 2

$$A_1 S_1 = A_2 S_2$$

$$\frac{S_1}{S_2} = \frac{A_2}{A_1} \longrightarrow \textcircled{2}$$

from $\textcircled{1}$ & $\textcircled{2}$

$$\frac{F_2}{F_1} = \frac{A_2}{A_1} = \frac{S_1}{S_2}$$

$$\boxed{F_1 S_1 = F_2 S_2}$$

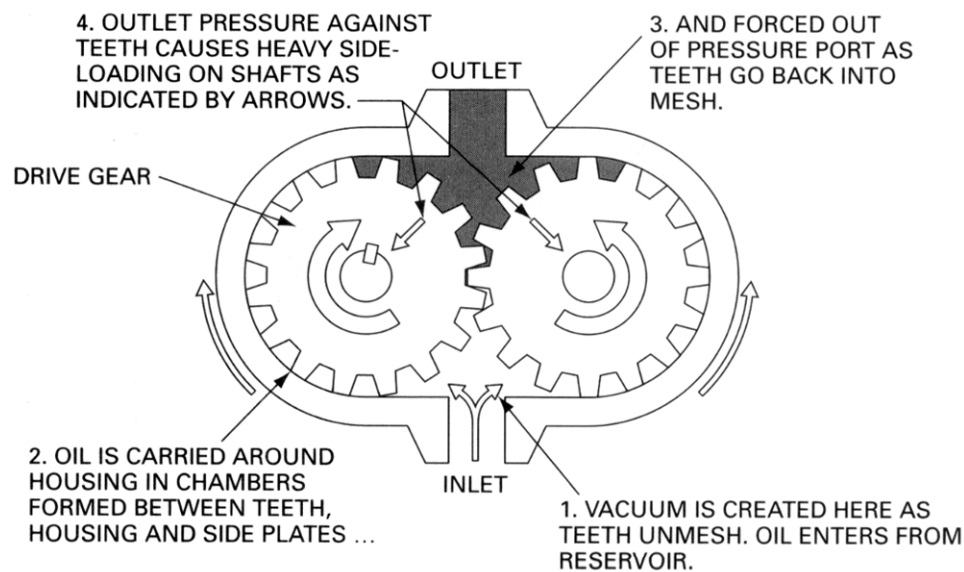
Question three (2 marks)

What are the functions of an Oil tank?

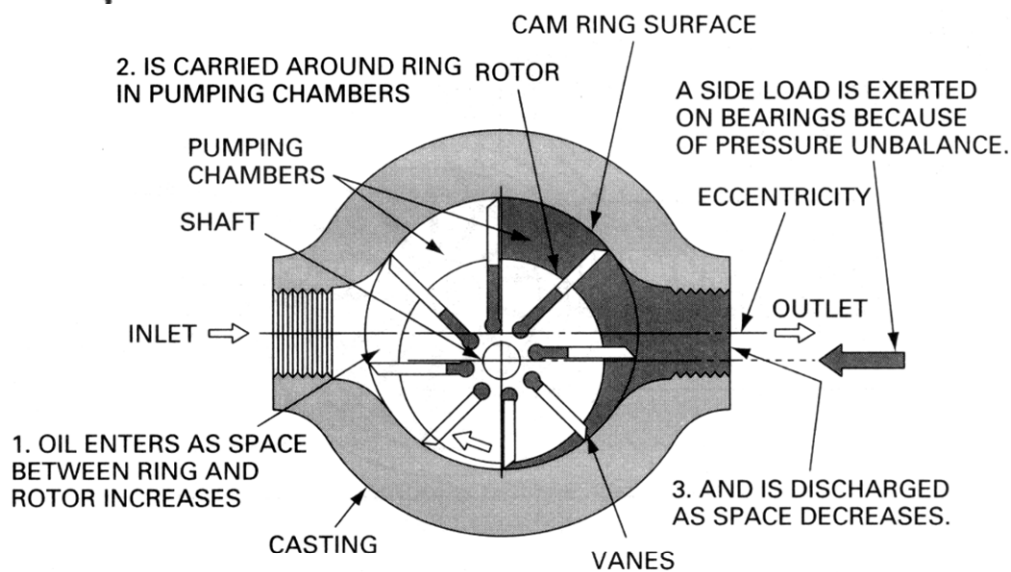
- 1 – Storing oil
- 2 – Cooling oil
- 3 – Separation of air from oil
- 4 – Draining of impurities from the bottom of tank.

Question four (6 marks)

Compare between Gear and Vane Pumps using neat sketches.



$$V_D = \frac{\pi}{4} (D_o^2 - D_i^2)L$$



$$e_{\max} = \frac{D_C - D_R}{2}$$

$$V_{D_{\max}} = \frac{\pi}{4} (D_C^2 - D_R^2)L$$