College of Engineering & Technology

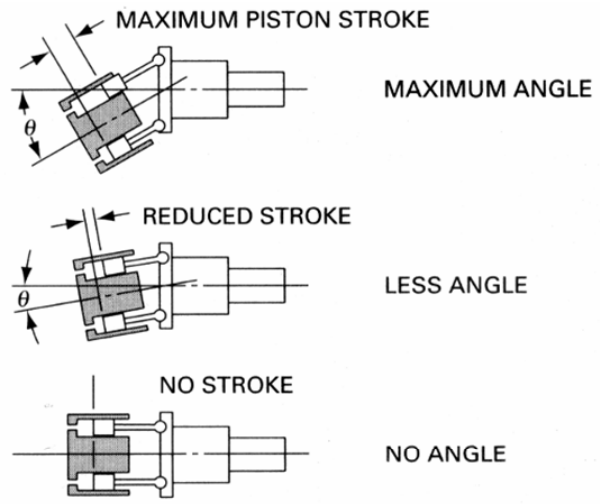
Department: Mechanical Engineering Marks: 20
Lecturer: Dr. Rola Afify Time: 3:00- 4:10
Course Code: ME464 Date: 30/4/2013

Name: **Model Answer**

Answer the following questions:

Question one (5 marks)

For the axial piston motor (bent-axis type) shown in figure, compare between the volumetric displacement in the three cases.



The Volumetric Displacement of the motor varies with the Offset Angle θ. No flow is produced when the Cylinder Block centerline is parallel to the Drive Shaft Centerline.

Question two (7 marks)

Find the flow rate in L/s that an axial piston pump delivers at 1000 rpm. The pump has nine 15 mm diameter pistons arranged on a 125 mm diameter piston circle. The offset angle is set at 10° and the volumetric efficiency is 94%.

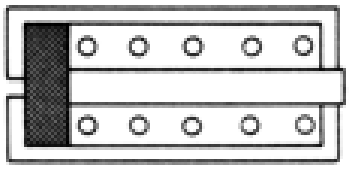
$Q_T = DxAxNxY \tan\theta = 0.125\ (3.14 \times 0.015^2/4) \times 1000 \times 9 \times \tan 10$
$= 0.0351\ m^3/min$

$Q_A = Q_T\ \eta_v = 0.0351 \times 0.94 = 0.033\ m^3/min$

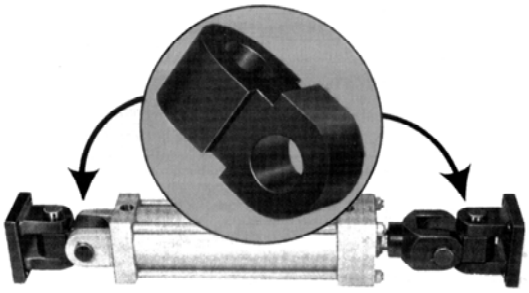
$Q_A = 0.033 \times 1/60 \times 1/0.001 = 0.55\ L/s$

Question three (8 marks)

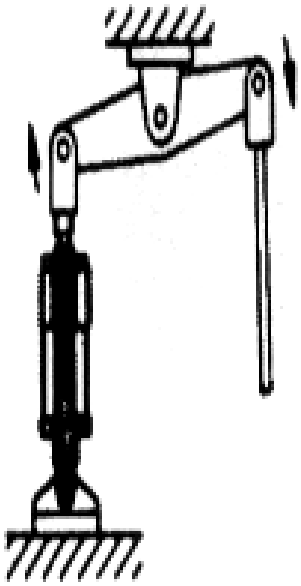
Write down the words that represent each of the following:



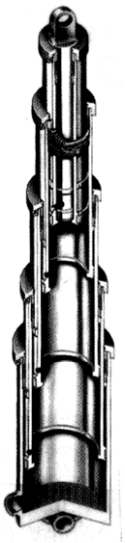
Single acting spring return cylinder



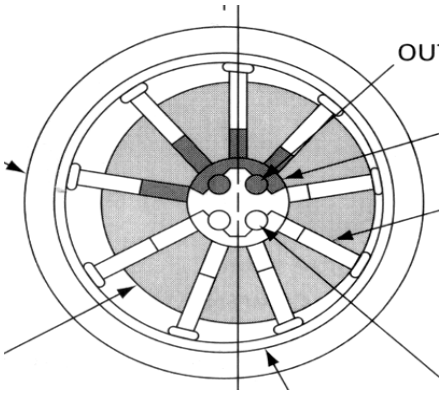
A Universal Alignment Mounting accessory



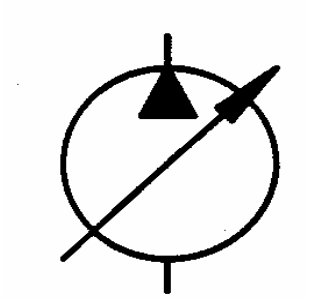
First-class lever



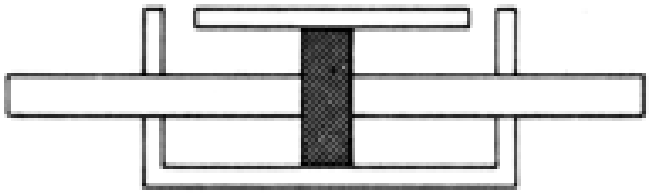
Telescopic cylinder



Radial Piston Pump



Variable Displacement Pump



Double rod cylinder

Good Luck 1/1