

Course title: **Hydraulic control**

Course Code: MPE 4424

Date: June, 2014 (2nd term)

Allowed time : 3 hrs

No. of Pages: 3

Remarks: (Answer the following questions, and assume any missing data)يسمح باستخدام الكتب و المراجع وأي مواد اخرى
Open sources exams**Question No. 1 (20 Marks)**

- a. What are the advantages and disadvantages of fluid power system?
b. What are the components of fluid power system?

c. For the fluid power system, the following data are given:

cylinder piston diameter = 20 cm

pump volumetric efficiency = 92%

cylinder rod diameter = 10 cm

pump mechanical efficiency = 90%

extending speed of cylinder = 7.5 cm/s

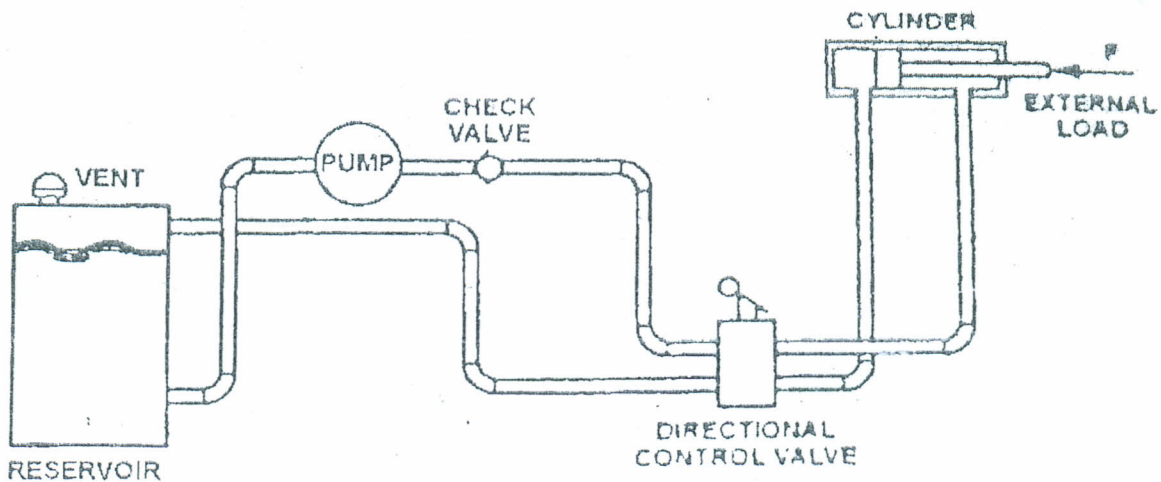
pump speed = 1800 rpm

external load on cylinder = 178 kN

pump inlet pressure = -0.28 bar

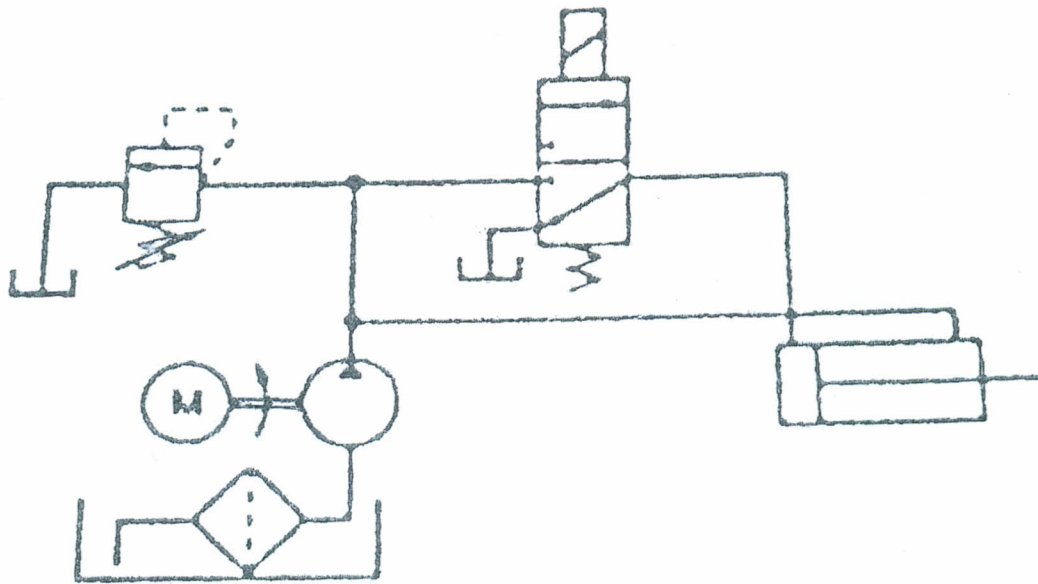
The total pressure drop in the line from the pump discharge port to the blank end of the cylinder is 5.2 bar. The total pressure drop in the return line from the rod end of the cylinder is 3.4 bar. Determine the:

- (a) Volumetric displacement of the pump,
(b) Input hp required to drive the pump,
(c) Input torque required to drive the pump,
(d) Percentage of pump input power delivered to the load.



Question No. 3 (20 Marks)

- a) What's the classification of fluid power system? And list the five of basic circuits.
- b) What's the main parameter of pump selection?
- c) A double acting cylinder is used in the regenerate circuit of the figure. The relief valve setting is 105 bars. The piston area is 130 cm^2 and the rod area is 65 cm^2 . If the pump flow is 16 lit/s, find the cylinder speed and load carrying capacity for the extension stroke and the retraction stroke.



Good Luck,
Dr. Hossam S.S. AbdelMeguid