UTM Kuala Lumpur
Plant Technology

TEST 1 (30%) **SEM 1 2015/2016** **1 hour**

Answer all questions

1. A pump has a displacement volume of 81935.3 mm^3. It delivers 0.0757 m^3/min at 1000 rpm and 68.9 bar. If the prime mover input torque is 102 Nm.
    a. What is the overall efficiency of the pump?
    b. What is the theoretical torque require to operate the pump? [3 marks]

2. A pump delivers 10 dm^3/min with a pressure rise 80 bar. The shaft speed is 1420 rev/min and the nominal displacement is 8 cm3/rev. The Torque input is 11.4 Nm.
    a. The volumetric efficiency.
    b. The shaft power.
    c. The overall efficiency. [7 marks]

    Note: 1 m^3 = 10^3 dm^3

3. Explain how cavitations occur when hydraulic oil up into the inlet port of the external gear pump. Name the components of a hydraulic circuit in Figure Q3.
    a. P1 _____
    b. R2 _____
    c. V2 _____
    d. C1 _____
    e. V1 _____

    [10 marks]

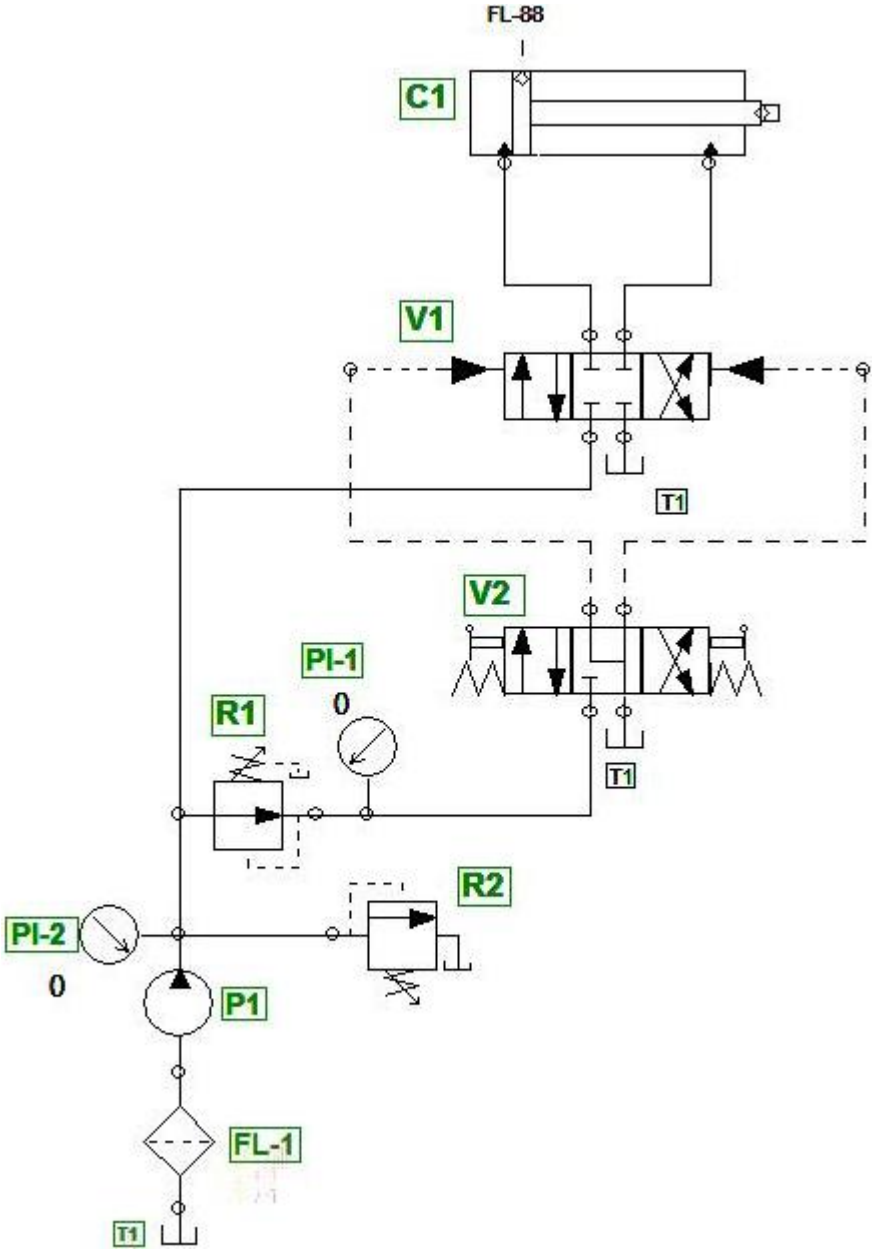

Figure Q3