P1 - Ch18 (30%) [Electric force/field]

a) $q_1 = g_2 = q_3 = q_4 = 10$ μC in Fig. 1. Find the electric force exerted on q_3, Mag.____957 N ___, Dir._____ y ____

b) $Q_1 = Q_2 = 20$ μC in Fig. 2. Find the electric field at point P_1, Mag. ___1.4E8 N/C ___, Dir._____ y _____

c) If $Q_1 = -10$ μC, $Q_2 = 10$ μC in Fig. 2. Recalculate electric field at P_1, Mag._____7.0E7 N/C _____, Dir.____ - x __

Fig. 1

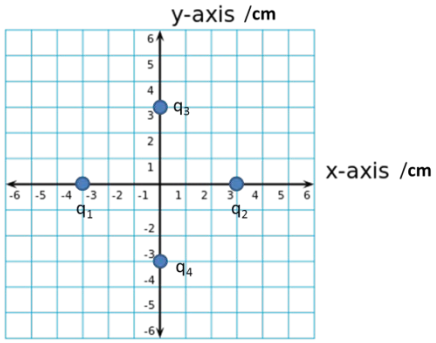
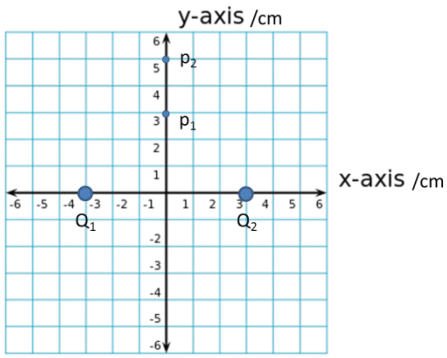


Fig. 2



P2 - Ch19 (20%) [Electric potential/potential energy]

a) In Fig.2, $Q_1 = Q_2 = 20$ μC, find the electric potential at P_1. Ans._____8.5E6 V _____

b) Find the electric potential at P_2. Ans._____6.2E6 V _____

c) Find the work needed to move a point charge q = 25 μC from point P_2 to P_1. Ans. _____57.5 J ____

d) If a point charge q = 25 μC is placed at P_1, what is the electric potential energy of this charge? Ans._____212.5 J _____

P3- Ch19 (25%) [Capacitors]

a) In Fig. 3, $C_1 = 10$ μF, $C_2 = C_3 = 5$ μF. Find the total capacitance connected to the 9-V battery. Ans.___5 uF ____

b) Find the voltage on C_2, Ans. _____4.5 V _____

c) Find the charge on C_1, Ans. _____45 uC _____

d) Find the electric energy stored on C_1, Ans. _____101 uJ _____

e) Find the current passing through the battery at equilibrium. Ans. _____0 ___

Fig. 3

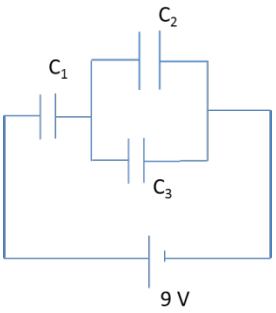
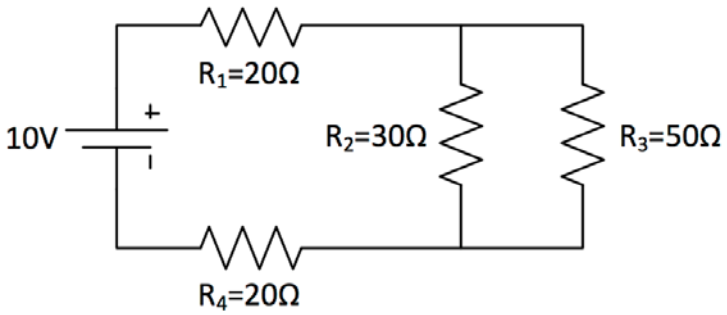


Fig. 4



P4 - Ch21 (25%) [Ohm's law, power]

a) In Fig. 4, what is the current in R_1? Ans._____0.17 A _____

b) The current in R_2? Ans._____0.11 A _____

c) The current on R_3? Ans._____0.06 A_____

d) The voltage on R_4? Ans._____3.4 V _____; e) the electric power on R_4? Ans.____0.58 W _____