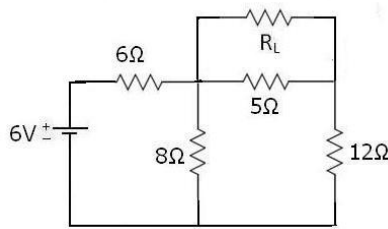


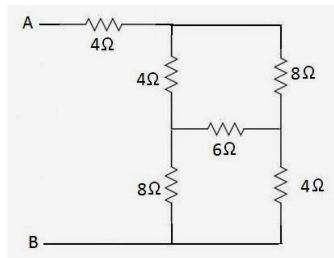
TEST -1

1). Find the value of R_L for the given network below that the power is maximum? And also find the Max Power through load-resistance R_L by using maximum power transfer theorem?



-10 marks

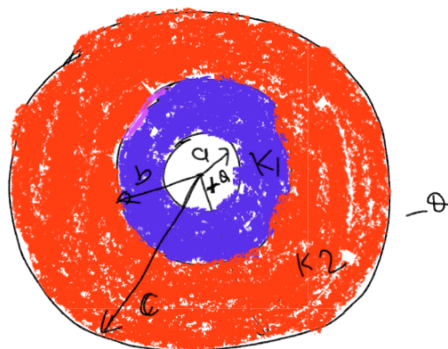
2) Find the equivalent in the given network.



resistance between A & B

-10 marks

3). Consider a conducting spherical shell with an inner radius a , and outer radius c . If the space between two surface be filled with two



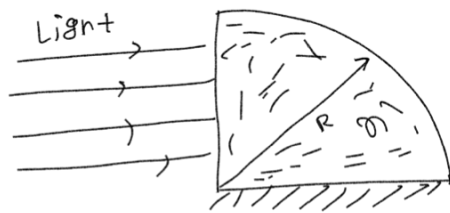
different dielectrics materials so that the dielectric constant K_1 between a and b , and K_2 between b and c , as shown in figure. Find the capacitance of system.

-10 marks

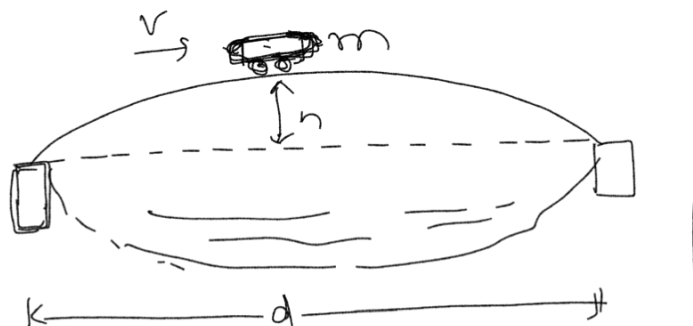
4) A particle of mass m carries an electric charge Q and is subject to the combined action of gravity and a uniform horizontal electric field of strength E . It is projected with speed v in the vertical plane parallel to the field and at an angle θ to the horizontal. What is the maximum distance the particle can travel horizontally before it is next level with its starting point? -10 marks

5) The inner surfaces of two close parallel insulating plates are each given a uniform charge of $+Q$. What force is required to hold the plates together? -10 marks

6) A glass prism in the shape of a quarter-cylinder lies on a horizontal table. A uniform, horizontal light beam falls on its vertical plane surface, as shown in the figure. -10 marks



7) There is a parabolic-shaped bridge across a river of width 100 m. The



highest point of the bridge is 5 m above the level of the banks. A car of mass 1000 kg is crossing the bridge at a constant speed of 20 m /s.

Using the notation indicated in the figure, find the force exerted on the bridge by the car when it is:

- (i) at the highest point of the bridge, (ii) three-quarters of the way across.

-2 2

(Ignore air resistance and take g as 10 m s

Using the notation indicated in the figure, find the force exerted on the bridge by the car when it is:

(i) at the highest point of the bridge and (ii) three-quarters of the way across. (Ignore air resistance and take g as 10 m/s^2). -20 marks.