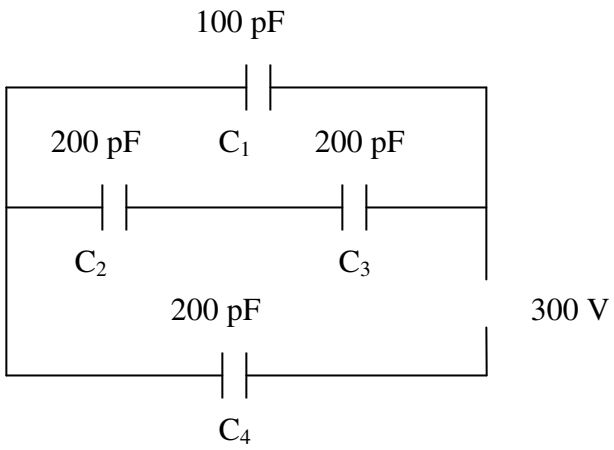

OR

Explain the principle on which Van-de-Graaff generator operates. Draw a labeled schematic sketch and write briefly its working.

A Van-de-Graaff type generator is capable of building up potential difference of 15 x 10^6V. The dielectric strength of the gas surrounding the electrode is 5 x 10^7 V m^{-1}. What is the minimum radius of the spherical shell required?

29. Draw a labeled ray diagram of a compound microscope and write an expression for its magnifying power. the focal lengths of the objective and eye-lens of a compound microscope are 2 cm, 6.25 cm respectively. The distance between the lenses is 15 cm. (i) How far from the objective lens will the object be kept, so as to obtain the final image at the near point of the aye? (ii) Also calculate its magnifying power.

OR

Draw a labeled ray diagram of an astronomical telescope, in the normal adjustment position and write the expression for its magnifying power.

An astronomical telescope uses an objective lens of focal length 15 cm and eye-lens of focal length 1 cm. What is the angular magnification of the telescope?

If this telescope is used to view Moon, what is the diameter of the image of Moon formed by the objectives lens? (Diameter of Moon = 3.5 x 10^6 m and Radius of lunar orbit = 3.8 x 10^8 m)

30. State the condition for resonance to occur in a series LCR a.c circuit and drive an expression for the resonant frequency.

Draw a plot showing the variation of the peak current (i_m) with frequency of the a.c source used. Define the quality factor, Q of the circuit.

Calculate the (i) impendence, (ii) wattles current of the given a.c circuit.