

### Weakness

Candidates failed to see that whilst the first capacitor charges up to 3.0 volts when the second capacitor is connected in parallel to it the total charge is conserved. The other group of candidates did not realize that  $C$  represented capacitance of the capacitors and were unable to mention charging in their answers.

### Expected Response

On closing  $S_1$  while  $S_2$  remains open

$$Q = CV = 3C; \text{ (since } V = 3.0\text{v)}$$

When  $S_1$  is opened and  $S_2$  is closed, charge  $Q$  is shared between the two capacitors.

$$C_r = C + C = 2C;$$

Since  $Q$  is the same and equals  $3C$

Letting new pd be  $V_1$ ,

$$Q = C_r V_1 = 3C$$

$$V_1 = \frac{3C}{2C} = 1.5V$$

### Question 30

Figure 15 shows water waves of different wavelengths incident on identical apertures A and B.



Figure 15.

Complete the diagrams to show the pattern of the waves beyond the aperture in each case.  
(1 mark)

Candidates were expected to show that diffraction will occur when the wavelength of the waves is comparable with the size of the aperture. In A no diffraction was expected since the wavelength is less than the width of the aperture. In B diffraction will occur, wavelength almost same as the size of aperture.