Roll Number

INDIAN SCHOOL MUSCAT
SECOND PERIODIC ASSESSMENT

PHYSICS

CLASS: 12

19.05.2019

Sub.Code: 042

TimeAllotted:50mts.

Max .Marks: 20

GENERAL INSTRUCTIONS:	
All questions are compulsory.	
There are 11 questions in all.	
Question no 1 to 5 carry one mark each.	
Question no 6 to 18 carry two marks each.	
Question no 9 to 11 carry three marks each.	
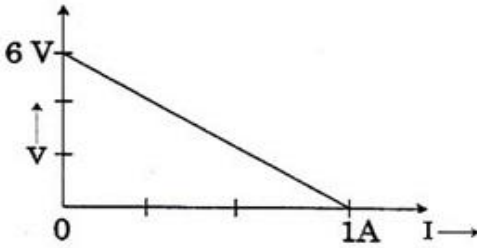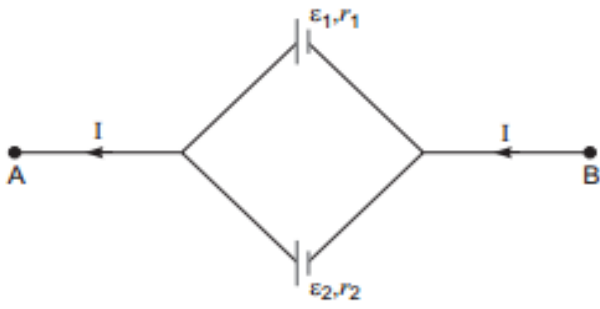
$$\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 Nm^2 C^{-2} \text{ N} \qquad \varepsilon_0 = 8.854 \times 10^{-12} \, C^2 N^{-1} m^{-2}$$

1.	How does the energy stored in a capacitor change if the plates of a charged capacitor are moved farther, the battery remaining connected?	1
2.	Define electrical conductance of a conductor and give its SI unit.	1
3.	Two materials Si and Cu, are cooled from 300 K to 60 K. What will be the effect on their resistivity?	1
4.	Express dielectric constant of a medium in terms of capacitance. What is its SI unit?	1
5.	What do you mean by dielectric strength of a dielectric?	1
6.	Derive an expression for the energy stored in a parallel plate capacitor C , charged to a potential difference V.	2
7.	The plot of the variation of potential difference across a combination of three identical cells in series, versus current is shown in figure. What is the emf and internal resistance of each cell?	2

8.	Two conducting wires **X** and **Y** of same diameter but different materials are joined in series across a battery. If the number density of electrons in **X** is twice that in **Y**, find the ratio of drift velocity of electrons in the two wires.	2
9.	Derive an expression for drift velocity of free electrons in a conductor in terms of relaxation time of electron.	3
10.	Two cells of emfs E_1 and E_2 having internal resistances r_1 and r_2 respectively are connected in parallel as shown. Deduce the expressions for the equivalent emf and equivalent internal resistance of a cell which can replace the combination between the points **A** and **B**.	3
11.	Two parallel plate capacitors **X** and **Y** have the same area of plates and same separation between them. **X** has air between the plates while **Y** contains a dielectric medium of $\varepsilon_r = 4$ (i) Calculate the capacitance of each capacitor if equivalent capacitance of the combination is **4** microfarad. (ii) Calculate the potential difference between plate X and Y.	3