Roll Number

INDIAN SCHOOL MUSCAT
SECOND PERIODIC ASSESSMENT

PHYSICS

CLASS: 12   Sub.Code: 042   TimeAllotted:50mts.

19.05.2019   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.

$$\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 Nm^2C^{-2} \text{ N} \qquad \varepsilon_0 = 8.854 \times 10^{-12} \, C^2N^{-1}m^{-2}$$

1.	Express dielectric constant of a medium in terms of capacitance. What is its SI unit?	1
2.	How does the energy stored in a capacitor change if after disconnecting the battery, the plates of a charged capacitor are moved farther?	1
3.	What do you mean by dielectric strength of a dielectric?	1
4.	Define electrical conductivity of a conductor and give its SI unit.	1
5.	Give an example of a material each for which temperature coefficient of resistivity is (i) positive , (ii) negative	1
6.	Derive an expression for the capacitance of a parallel plate capacitor, whose plates are separated by a dielectric medium.	2
7.	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
8.	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

9.	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
10.	Establish a relation between electric current and drift velocity	3
11.	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