

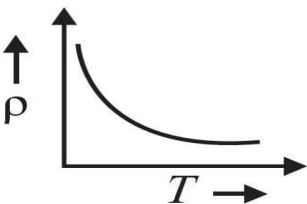
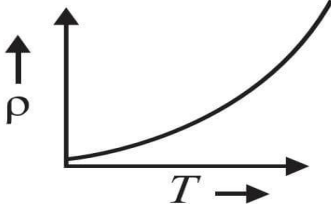
Date: 27/10/22
GRADE: XII

MONTHLY TEST - 03 (2022-23)
PHYSICS

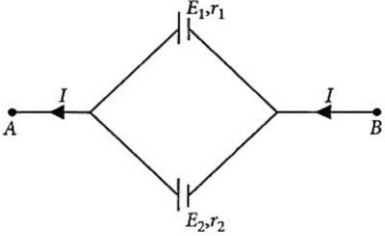
Max marks: 40
Time: 2 Hours

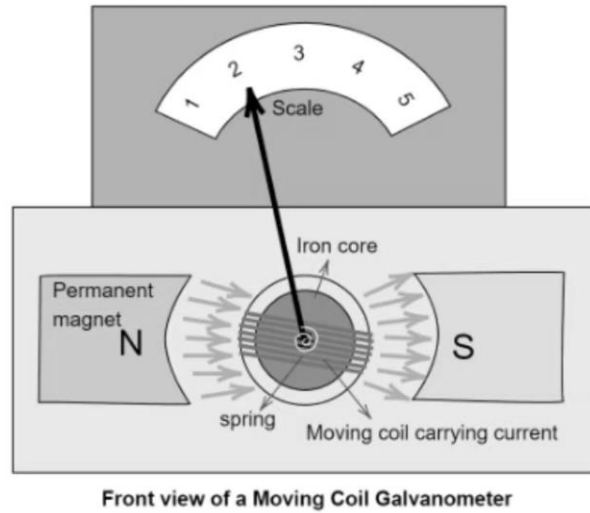
General Instructions:

- There are 27 questions in the question paper. All questions are compulsory.

Qn. No		Marks
I	Choose the correct option	
1	The rate of flow of electric charge through any cross section of a conductor is called _____ (a) electric flux (b) electric potential (c) electric current (d) electric field	1
2	The SI unit of resistivity is _____ (a) ohm -meter (b) newton (c) Ohm (d) meter	1
3	The temperature dependence of resistivity of material A and material B is represented by fig (i) and fig(ii) respectively. Identify material A and B. <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>fig. (i)</p> </div> <div style="text-align: center;">  <p>fig. (ii)</p> </div> </div> (a) A is copper and B is germanium (b) A is germanium and B is copper (c) A is nichrome and B is germanium (d) A is copper and B is nichrome	1
4	The resistivity of certain metals or alloys drops to zero when they are cooled below a certain temperature. This phenomenon is known as _____ (a) conductivity (b) partial conductivity (c) superconductivity (d) non- conductivity	1

5	The total resistance in a series combination of resistors is _____ than the greatest resistance in the circuit. (a) more (b) less (c) equal (d) zero	1
6	According to Oersted, around a current carrying conductor, magnetic field exists (a) as long as there is current in the wire (b) even after removing the current in the wire (c) only few seconds after removing the current (d) none of these	1
7	Biot – Savart law indicates that the moving electrons (velocity v) produce a magnetic field B such that (a) B is parallel to v (b) B is perpendicular to v (c) it obeys inverse cube law (d) v becomes zero	1
8	To convert a galvanometer into an ammeter, one needs to connect a (a) low resistance in series (b) high resistance in parallel (c) low resistance in parallel (d) high resistance in series	1
9	If a coil carrying electric current is placed in uniform magnetic field (a) e.m.f is induced (b) torque is formed (c) both (a) and (b) are correct (d) none is correct	1
10	According to Curie's law, the magnetic susceptibility of a substance at an absolute temperature T is proportional to (a) T^2 (b) T (c) $1/T^2$ (d) $1/T$	1
II	Assertion and Reason Two statements are given – one labelled Assertion (A) and the other labelled Reason (R). Choose the correct option from the following	
11	ASSERTION(A): The resistivity of a semiconductor decreases with increase in temperature REASON(R): As temperature increases, the number density of charge carriers increases (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true and R is NOT the correct explanation of A (c) A is true but R is false (d) A is false and R is also false	1

V	Long answer questions	
19	<p>(a) Differentiate between e.m.f. and voltage</p> <p>(b) Two cells of emfs E_1 and E_2 and internal resistances r_1 and r_2 respectively are connected in parallel as shown in the figure.</p> <p>Deduce the expression for the</p> <ol style="list-style-type: none"> equivalent emf of the combination equivalent internal resistance of the combination potential difference between the points A and B  <p style="text-align: center;">OR</p> <p>(a) State the two Kirchhoff's rules used in the analysis of electric circuits and explain them.</p> <p>(b) Derive the equation of the balanced state in a Wheatstone bridge using Kirchhoff's laws.</p>	5
20	<p>(a) Define the term magnetic susceptibility and write its relation in terms of relative magnetic permeability.</p> <p>(b) A short bar magnet placed with its axis at 30° with an external field of 800 G experiences a torque of 0.016 Nm.</p> <ol style="list-style-type: none"> What is the magnetic moment of the magnet? What is the work done in moving it from its most stable to a most unstable position? <p style="text-align: center;">OR</p> <p>Compare the three types of magnetic materials with suitable examples.</p>	5
VI	Case study	
	<p>Read the following paragraph and answer the questions</p> <p>Moving coil galvanometer operates on Permanent Magnet Moving Coll (PMMC) mechanism and was designed by the scientist Darsonval. Moving coil galvanometers are of two types</p> <ol style="list-style-type: none"> Suspended coll Pivoted coil type or tangent galvanometer, <p>Its working is based on the fact that when a current carrying coil is placed in a magnetic field, it experiences a torque. This torque tends to rotate the coil about its axis of suspension in such a way that the magnetic flux passing through the coil is maximum</p>	



- (i) A moving coil galvanometer is an instrument which
- is used to measure emf
 - is used to measure potential difference
 - is used to measure resistance
 - is a deflection instrument which gives a deflection when a current flows through its coil
- (ii) The deflection in a moving coil galvanometer is
- directly proportional to current in the coil
 - directly proportional to the number of turns in the coil
 - inversely proportional to the area of the coil
 - inversely proportional to the torsional constant of spring
- (iii) In a moving coil galvanometer, having a coil of N -turns of area A and carrying current I is placed in a radial field of strength B . The torque acting on the coil is
- $NA^2 B^2 I$
 - $NABI^2$
 - $N^2 ABI$
 - $NABI$
- (iv) To increase the current sensitivity of a moving coil galvanometer, we should
- decrease strength of magnet
 - increase torsional constant of spring
 - increase the number of turns in coil
 - decrease area of coil

THE END

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