Assignment

PHYSICS (General)

(**Arrear**)

Paper: 201

Full Marks : 50

Time : 3 hours

Submission date: 10/08/2020

1. Answer the following questions: 1×6=6

    (a) Why soft iron is used in electromagnets?

    (b) A capacitor blocks d.c. and allows a.c. why?

    (c) Write down the S.I. unit of absolute permeability µ of a medium?

    (d) What is the effect of dielectric in a condenser?

    (e) What coupling coefficient denotes?

    (f) What is the dimension of RC?

2. Answer the following questions: 2×4=8

    (a) Distinguish between dia, para and ferromagnetism.

    (b) Defines the polar and non-polar molecules. Give examples.

    (c) Establish Ohm's law from the relation $\vec{J} = \sigma\vec{E}$. Symbols have their usual meanings.

    (d) Distinguish between acceptor and rejector circuit.

3. Answer any *three* questions of the following: 5×3=15

    (a) A 50 ohm coil galvanometer can carry a current 10 mA. How can you convert it into

       (i) voltmeter of range 500 volts

       (ii) ammeter of range 10 amp ?   5

    (b) A parallel plate capacitor consist of two square metal plates 5 cm of each side and separated by 1

    cm. A dielectric slab 6 mm thick is placed on the lower plate, calculate the capacitance of the

    capacitor. The dielectric constant of the material of the slab is 4.   5

(c) A circuit consists of a resistance and capacitance in series. An alternating emf of 180 volts, 100 cps frequency is applied to it. Calculate the value of resistance and capacitance when the maximum current is 6 amp and power is 360 watt. 5

(d) If a current of 4.5 μamp through a galvanometer causes a deflection of 1.5 cm on a scale 1 metre away. Find (i) the current sensitivity, (ii) p.d. across the galvanometer coil if its resistance is 120 ohms and (iii) maximum current for full scale deflection of 40 div. 5

4. Answer the following questions: 5×3=15

(a) Define (i) resistivity, (ii) conductivity. Establish the relation $\vec{J} = \sigma\vec{E}$. Symbols have their usual meanings.

(b) For a parallel plate capacitor obtain the expression of energy stored. Give its unit.

(c) Show that the torque acting on a magnetic dipole of moment $\vec{\mu}$ placed in a uniform magnetic field $\vec{B}$ is given by $\vec{\tau} = \vec{\mu} \times \vec{B}$. Give the dimension of $\vec{B}$.

5. Answer any *one* of the following: 6×1=6

(a) Give the theory of a transformer. What are the energy losses?

(b) Give the theory of a moving coil ballistic galvanometer.

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N.B. – Mention your class roll no. and GU roll no. at the answer script properly. Upload the pdf version of answer script at the web portal adjacent to the view bottom of respective paper.