

HOPE HALL FOUNDATION SCHOOL
FIRST TERMINAL EXAMINATION (2014-2015)
PHYSICS (THEORY)
CLASS XII
SET-1

TIME ALLOWED :3 HOURS

MM:70

GENERAL INSTRUCTIONS

- 1.All questions are compulsory.
- 2.Question numbers 1 to 8 carry one mark each.
- 3.Question numbers 9 to 18 carry two marks each
- 4. Question numbers 19 to 27 carry three marks each
- 5. Question number 28 to 30 carry five marks each

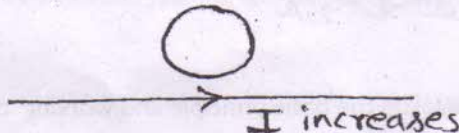
Q1. Why is photo diode reverse biased?

Q2. Tyres of aeroplanes are conducting , why?

Q3. What is the angle of dip at equator?

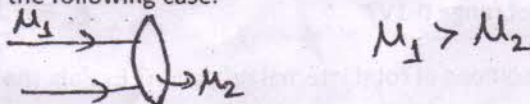
Q4. What is the colour code of a carbon resistor whose resistance is $2.7 \times 10^4 \Omega$?

Q5. Find the direction of induced current in the given loop.



Q6. When is the power factor of LCR ac circuit unity?

Q7. Draw the refracted rays in the following case.



Q8. When is the torque acting on a electric dipole placed in uniform electric field maximum?

Q9. Explain the working of Zener diode as voltage regulator.

Q10. Draw well labelled diagram of reflecting type telescope.

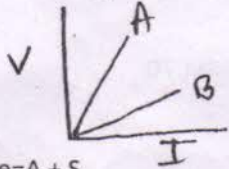
Q11. State the basic principle of capacitor.

Q12. Derive the expression for electric field due to small electric dipole at a point on axial line.

Q13. Find the electric field strength required just to support a water drop of mass 10^{-7} kg and having a charge 1.6×10^{-19} C.

Q14. Derive the expression relating drift velocity of electron with resistivity.

Q15. Which of the following plots for resistors show higher temperature and why?

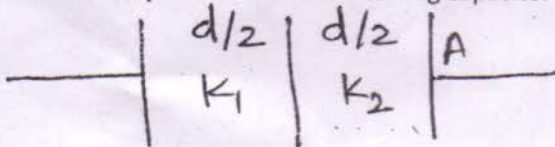


Q16. Prove that $i + e = A + S$.

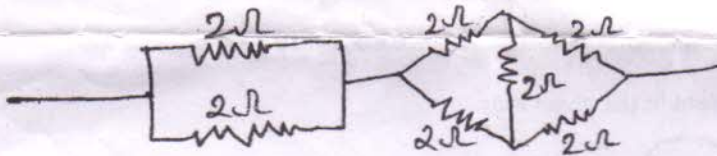
Q17. (a) What are eddy currents?

(b) What are the factors on which coefficient of self inductance depends?

Q18. What is the capacitance of the following capacitor?



Q19. Find the equivalent resistance of the following circuit.



$$V = IR$$

$$\frac{V}{I} = R$$

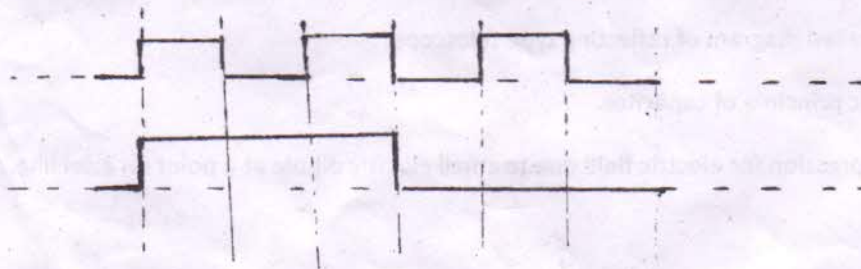
Q20. With help of well labelled circuit diagram explain the basic principle and working of transistor as a switch.

Q21. A galvanometer of resistance 50 ohms gives full scale deflection for a current of 2mA. How will you convert it into a voltmeter of range 0-1V?

$$R = \frac{V}{I_g} - G$$

Q22. What are the essential conditions of total internal reflection? Explain the working of optical fibres.

Q23. If the following input is fed to AND gate then find the output.



$$\frac{1}{5} + \frac{1}{5} = \frac{2}{5} = \frac{1}{2.5}$$

Q24. When are the following observations possible-

- a. a lens becomes invisible in a medium.
- b. a ship appears in the sky in Greenland.
- c. a convex lens starts behaving like concave lens.

Q25. Write the dimensional formula of the following-

- a. magnetic moment
- b. angle of declination
- c. magnetic flux

OR

Q25. Explain the nature of force acting between two straight current carrying conductors carrying equal current in the opposite direction.

Q26. With the help of circuit diagram explain the working of transistor as CE amplifier.

Q27. With help of well labelled diagram explain the basic principle and working of ac generator.

OR

Q27. With help of well labelled diagram explain the basic principle and working of transformer

Q28. Derive Lens maker's formula.

OR

Q28. With the help of well labelled ray diagram derive the expression for magnifying power of compound microscope.

Q29. With the help of well labelled diagram explain the basic principle and working of moving coil galvanometer.

OR.

With help of well labelled diagram explain the basic principle and working of cyclotron.

Q30. In an LCR series circuit $R=20 \text{ ohms}$, $L=0.2\text{H}$, $C=200\mu\text{F}$ and $I(t)=200\sin 100t \text{ A}$. Find

- a. impedance
- b. Instantaneous voltage.
- c. Power dissipated.

OR

Q30. Derive the expression for power factor of LCR series circuit. What is power factor of a pure resistive circuit?

Handwritten calculations and notes at the bottom of the page:

$$\begin{array}{r} 20 \\ 13 \\ \hline 260 \\ 20 \times \\ \hline 260 \end{array}$$

$$\begin{array}{r} 10 \mid 1300 \\ 10 \mid 130 \\ 13 \mid 13 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 10 \mid 130 \\ 10 \mid 130 \\ \hline 20 \\ 20 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 20 \\ 10 \\ \hline 30 \\ 30 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 100 \\ 20 \\ \hline 200 \\ 200 \\ \hline 400 \end{array}$$

Cl-XII-Phy-set 7 (B-3)