

E-19-X

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PHYSICS

(Long Answer Type Questions)

1. Explain the principle and working vale de Graff generator,

Or

Suite Gauss's theorem in electrostatics. Derive an expression for the electric field due to uniformly charged spherical shell at a point outside the shell

2. What is a magnetic dipole ? Obtain expression for the strength of magnetic field at a distance from its centre on axial line.

Or

Prove that two parallel conductors of infinite lengths, carrying currents in the same direction attract each other. Deduce the expression for the force per unit length experienced by each conductor.

3. Describe the principle, construction and working of a transformer.

Or

What is meant by r.m.s value of a.c.? Derive the relation for root mean square value of a.e.

4. Derive the Len's Maker's formula for a convex lens.

Or

Deduce the conditions of maxima and minima in Young's double slit experiment and find an expression for fringe width.

(Short Answer Type Questions)

5. Explain conservation of charge.

6. A wire of resistance 5Ω drawn out so that its length is increased to twice its original length. Calculate its new resistance.

7. Explain, how you will compare the e.m.f's of two cells of a potentiometer

8. How can a galvanometer be converted into ammeter ? Find its resistance.
9. Write down important properties of electromagnetic waves,
10. Show that in case of a prism. $A + \delta = i + e$ where symbols have their usual meanings.
11. For a given medium, the polarising angle is 60° What will be the critical angle for this medium? <https://www.jkboseonline.com>
12. What is junction transistor? Mention its two types. How are they represented ?

(Very Short Answer type Questions)

13. A 100 Hz a.c. is flowing in a 14 mH coil. Find reactance of the coil.
14. Draw a labelled diagram showing course of rays for a simple microscope
15. Why sky wave propagation of electromagnetic waves cannot be used for TV transmission ?
16. What is Modulation ? Define amplitude modulation.
17. Derive de-Broglie wave equation for material particles.
- 18 Define binding energy. Sketch the graph between binding energy per nuclear and mass number.
19. Define the term half-life of a radioactive substance and write its relation with decay constant.
20. What is a Hole? Which type of doping creates a hole?

(Objective Type Questions)

21. (i) The electromagnetic waves used in the telecommunication are:
(a) ultraviolet (b) infrared (c) visible (d) microwaves
- (ii) The ratio of drift velocity to that of the thermal velocity of an electron in a conductor is of the order of:
(a) 10^{-6} (b) 10^{-8} (c) 10^{-5} (d) 10^{-10}
- (iii) For the current in LCR-circuit to be maximum:
(a) $\omega^2 = LC$ (b) $\omega^2 = \frac{1}{LC}$
(c) $\omega = \frac{1}{LC}$ (d) $\omega = LC$

(iv) Define wavefront of light.

(V) One photon of light is capable of ejecting one electron only. (True/False)

(vi) The threshold frequency of photon for photoelectric emission from a metal of work function 0.1 eV is (Fill in the blank)

(vii) Define mass defect.

(viii) When nuclear fission and fusion reactions occur, what decreases in both the cases?

(ix) Draw p-n junction with forward bias.

(x) Why doping is done?

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