

12thRPKGO18
20501
PHYSICS

Time : 3 Hours]

[Maximum Marks : 70

(Long Answer Type Questions)

5 each

1. Calculate the current in an external circuit when a number of cells are connected in :

(a) series

(b) parallels

Or

State and explain Kirchhoff's laws.

2. Derive an expression for the torque experienced by a current carrying rectangular coil placed in uniform magnetic field.

Or

What are dia, para and ferromagnetic materials ? Discuss their properties.

(2)

3. Explain principle and working of a transformer. What are its various energy losses ?

Or

What is meant by r.m.s. value of alternating voltage ? Derive an expression for r.m.s. value of alternating voltage.

4. State and explain Huygen's principle. Prove Snell's law of refraction on the basis of Huygen's principle.

Or

What is diffraction of light ? Explain diffraction of light at a single slit and derive an expression for width of central maxima.

(Short Answer Type Questions)

3 each

5. An electron revolve round the nucleus of hydrogen atom at a distance of 5×10^{-11} m. Calculate electrostatic force.
6. Deduce relations for energy stored in a charged capacitor.
7. What do you know about sensitivity of a Galvanometer ?
8. Sun looks reddish at sun set and sun rise. Explain why.
9. Derive an expression for the equivalent focal length for two thin lenses in contact.
10. What are the limitations of Bohr's atomic model ?
11. Distinguish between forward and reverse biasing in a p-n junction diode with the help of circuit diagram.
12. What is LED ? Explain its working.

(3)

(Very Short Answer Type Questions)

2 each

- ~~13.~~ List various properties of electric field lines.
14. Calculate the resistivity of the material of the wire of length 2.0 m, diameter 1.0 mm having 50 ohm resistance.
15. What should be the frequency of alternating 200 volt as to pass a maximum current of 0.9A through an inductance of one henry ?
- ~~16.~~ Write any *four* uses of e.m. waves. <https://www.jkboseonline.com>
- ~~17.~~ State *two* conditions to obtain sustain interference.
- ~~18.~~ Why are alkali metals most suitable for photoelectric effect ?
- ~~19.~~ What is Nuclear fission ?
- ~~20.~~ What is amplitude modulation ? Mention its *two* advantages.

(Objective Type Questions)

1 each

21. (i) Which of the following materials is more suitable for making cores of transformers ?
- | | |
|---|---------------------|
| (a) Nickel | (b) Copper |
| <input checked="" type="checkbox"/> (c) Soft iron | (d) Stainless steel |
- (ii) Work function is measured in :
- | | |
|---|----------|
| <input checked="" type="checkbox"/> (a) Electrovolt | (b) Volt |
| (c) Joul/sec | (d) Watt |

(4)

(iii) In case of intrinsic semiconductor charge carriers are mostly :

- (a) Holes
- (b) Electrons
- ~~(c)~~ Both electrons and holes
- (d) Neither holes nor electrons

~~(iv)~~ Give two uses of X-rays.

~~(v)~~ What is total internal reflection ?

(vi) Photoelectric effect illustrates the particle nature of light.

(True/False)

~~(vii)~~ Nuclear density = $2.38 \times 10^{11} \text{ kg/m}^3$.

(True/False)

~~(viii)~~ Define the term information in communication.

~~(ix)~~ What is Carrier wave ?

~~(x)~~ Bandwidth of TV signal is

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