

**+2 PHYSICS STUDY MATERIAL -
IMPORTANT TEN MARKS QUESTIONS
ENGLISH MEDIUM : VOLUME - 1 & 2**



PRESENTED BY

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UNIT : 1 Electrostatics – ten marks questions

1. What is an electric dipole? Derive an expression for the electric field due to an electric dipole at a point on its axial line. (M - 06, J - 06, M - 09, J - 10, O - 10, M - 11)
2. Derive an expression for electric potential due at a point to an electric dipole. Discuss the special cases. (O - 06, M - 08, J - 08, M - 10, O - 11)
3. Deduce an expression for equivalent capacitance of capacitors connected (i) parallel (ii) series. (J - 07, O - 07)
4. Principle, construction and working of Van de Graaff generator. What is its use? (O - 08, O - 09, O - 12)
5. Derive an expression for electric field due to an electric dipole at a point along the equatorial line. (M - 07, J - 09)
6. State Gauss's law. Applying this calculate electric field due to (i) an infinitely long straight charged with uniform charge density. (J - 11, M - 12)
7. Explain the principle of a capacitor. Deduce an expression for the capacitance of a parallel plate capacitor. (J - 12)
8. What is dielectric? Explain the effect of introducing a dielectric slab between the plates of a parallel plate capacitor.
9. State Gauss law using this find an expression for electric field due to uniformly charged spherical shell at a point (i) outside the shell (ii) on the surface (iii) inside the shell.

UNIT : 3 Effects of electric current – ten marks questions

1. Discuss the motion of a charged particle in a uniform magnetic field. Define magnetic Lorentz force. (J - 10)
2. Explain the principle, construction, working and limitations of a cyclotron with a neat diagram. (M - 07, O - 10, O - 11)
3. Obtain an expression for the torque experienced by a current loop in a uniform magnetic field.
4. Obtain expression for a magnetic induction due at a point to infinitely long straight conductor carrying current. (J - 06, O - 09, M - 10)
5. Apply Biot – Savart law, obtain an expression for the magnetic induction at a point due to infinitely long straight conductor carrying current. (M - 06)
6. Define ampere's circuit law. Applying it find the magnetic induction at a point due to a long solenoid carrying current. (O - 06, J - 09)
7. State Joule's law. Explain Joule's calorimeter experiment to verify Joule's law of heating. (J - 07, J - 12)
8. Deduce the relation for the magnetic induction, at a point along the axis of a current coil carrying current. (O - 07, M - 08, M - 12)
9. State Tangent law. Explain in detail the principle, construction and theory of a tangent galvanometer. (J - 08)
10. Deduce expression for the force on a current carrying conductor placed in a magnetic field. Find the magnitude of the force. (O - 08, M - 09, J - 11, O - 12)
11. Obtain an expression for the force between two long parallel current carrying conductors. Hence define "ampere". (M - 11)

UNIT : 4 Electromagnetic induction and Alternating current**– ten marks questions**

1. Principle, construction, theory of working of transformer of a transformer. Define its efficiency.
Mention the energy losses. (M - 06, M - 12)
2. Describe principle, construction, and working of a single phase *Alternating Current* generator.
(M - 07, M - 08, J - 07, O - 07 O - 10, J - 11, M - 11, J - 12)
3. Discuss with theory the method of inducing *e.m.f* in a coil by changing its orientation with respect to the direction of the magnetic field. (J - 08, O - 09, J - 10, O - 11, M - 11)
4. Obtain the phase relation between voltage and current in an *A.C* circuit containing a pure inductance.
Draw the necessary graph. (O - 08)
5. What are eddy current? Explain their applications. How are they minimized? (M - 09)
6. In an ac circuit containing a capacitor, the instantaneous emf is $e = E \sin \omega t$. Obtain the expression for instantaneous current. Explain the phase relation between emf and current by graph. (O - 06)
7. Explain the mutual induction between two long solenoids. Obtain an expression for the mutual inductance.
8. A source of alternating emf is connected to a series combination of a resistor R, Inductor L, Capacitor C. Calculate the current, resultant voltage and the phase angle between the current and the voltage. (J - 06, J - 09, O - 12)

Best wishes

UNIT : 5 Electromagnetic waves and wave optics – ten marks questions

1. Explain Raman scattering of light with the help of energy level diagram. (M - 07, O - 07 M - 08, J - 11)
2. Write a note on (i) Nicol Prism (ii) Polaroid.
3. On the basis of wave theory, explain total internal reflection. Write the conditions for the total internal reflection to take place. (M - 06, J - 06)
4. What is known as interference? Derive an expression for band width of interference fringes in Young's double slit experiment. (O - 06, O - 11, O - 10, J - 07, J - 10, M - 09, M - 11)
5. Explain emission and absorption spectra. (J - 09, M - 10, M - 12, J - 12, O - 12)
6. State Huygens's principle on the basis of wave theory. Prove the laws of reflection. (O - 08)
7. Explain theory of interference in thin transparent film due to reflected light and obtain the condition for the intensity to be maximum and minimum. (J - 08, O - 09)
8. What are called Newton's rings? Explain the experiment and theory of formation of the Newton's ring.
9. Discuss the theory of plane transmission grating.
10. Explain the refraction of a plane wave front at a plane surface and state laws of refraction.

Unit – 6 Atomic Physics - ten marks questions

1. State Bohr's postulates. Obtain an expression for the radius of n^{th} orbit of hydrogen atom based on the Bohr's Theory. (M - 06, M - 08, J - 09, M - 12)
2. Describe the J.J Thomson method for determine the specific charge of an electron. (O - 09, M - 10, J - 10, O - 10, O - 11, J - 12)
3. Explain the working ruby laser with the help of energy level diagram. (O - 06, J - 07, M - 09, J - 11, O - 12)
4. How will you determine the wavelength of x-rays using Bragg's spectrometer. Write any five properties of x-rays. (M - 07)
5. Derive Bragg's law. Explain how a Bragg's spectrometer can be used to determine the wavelength of x-rays. (J - 07)
6. Draw a neat diagram of the He-Ne laser and explain its working with the help of energy level diagram. (J - 06, M - 11)
7. Describe Millikan's oil drop experiment to determine the charge of an electron. (J - 08, O - 08)
8. Explain Sommerfeld atom model.
9. Give an account for principle of laser, laser action and characteristic laser.
10. Obtain an expression for the energy the electron of n^{th} orbit of hydrogen atom based on Bohr's theory.

Best wishes

Unit – 8 Nuclear Physics - ten marks questions

1. Describe the principle and action of a Bainbridge Mass spectrometer in determining the isotopic masses. (J - 06, J - 07, J - 08, O - 06, M - 09, J - 10, O - 10, J - 11, O - 12)
2. Explain the construction and working of a Geiger Muller counter. (M - 07, O - 07, J - 09, M - 11)
3. What are cosmic rays? Explain the latitude effect and altitude effect regarding cosmic rays. (M - 08, M - 10)
4. Obtain an expression for the amount of the radioactive substance present at any moment.
Obtain the relation between half life period and decay constant. (O - 08, O - 09, O - 11, M - 12, J - 12)
5. What is the nuclear reactor? Explain the function of (i) moderator (ii) control rod (iii) neutron reflector.
Mention the uses of nuclear reactor. (diagram not necessary) (M - 06)
6. Compare the properties of alpha, beta and gamma rays.
7. Explain the stellar energy with proton-proton cycle and carbon-nitrogen cycle?

Unit – 9 Semi conductor devices - ten marks questions

1. With the circuit diagram, explain the working of a Bridge rectifier. Draw its input and output signals.
What are the advantages. (M - 06, J - 07, M - 10, J - 10, O - 11, J - 12)
2. Explain with neat circuit diagram, the working of single stage CE amplifier. Draw the frequency response curve and discuss the result. (J - 08, M - 11)
3. Sketch the circuit of a Colpitt's oscillator and explain its working. (J - 06, O - 06, M - 08, J - 09, J - 11, M - 12)
4. With a circuit diagram, explain the working of an operational amplifier as a summing amplifier. (M - 07, J - 12)
5. Explain the action of an operational amplifier as difference amplifier. (O - 07)
6. What meant by feed back? Derive an expression for voltage gain of an amplifier with negative feedback. (M - 09)
7. What is operational amplifier? Explain its action as (i) inverting amplifier (ii) non-inverting amplifier. (O - 09)
8. What is called amplifier? With a circuit explain the working of transistor as amplifier.
Explain the frequency response curve. (O - 08, M - 11)
9. With the help of neat circuit diagram, explain the output characteristic of an NPN transistor in CE mode and methods of finding the parameters. (J - 08, O - 10, O - 12)
10. Describe the energy band structure of insulator, semi conductor and conductor.
11. Describe the construction and working of a multimeter with a neat diagram. Explain how is it used as a voltmeter and ohm-meter.
12. Explain the characteristic and working of PN junction diode in forward and reverse bias.

Unit – 10 Communication Systems - ten marks questions

1. Make the analysis of amplitude modulated wave. Plot the frequency spectrum and band width. (J - 06, O - 06, M - 08, M - 09, J - 10, O - 10, J - 12)
2. With the help of a functional block diagram. Explain the operation of a super heterodyne AM receiver. (J - 07, M - 11, M - 12)
3. With the help of a functional block diagram, explain the function of a monochrome TV receiver. (M - 06, M - 07, M - 10, J - 11)
4. With the help of block diagram, explain the function of various units in the monochrome television transmitter. (J - 08, O - 08, O - 09)
5. Explain the construction and working of a vidicon camera tube with neat diagram. (J - 09)
6. With the help of block diagram, explain the function of radar system. (O - 07, O - 11, O - 12)

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