SWAMI VIVEKANANDA MATRIC HR .SEC.SCHOOL - ARUMBAVUR
PUBLIC EXAM EXPECTED QUESTIONS - 2022
PHYSICS – XII - Important 2m,3m and 5m
Unit – 1

> ### 2mark: - II

2. Write down coulomb's law in vector form and mention what each term represents.

3. What are the difference between Coulomb force and gravitational force?*

5. Define electric field?

8. Define electric dipole?*

10. Define electrostatic potential?

15. Define electric flux?*

20. Define capacitance? Give its units.

21. What is corona discharge?*

> ### 3mark: - III

5. Derive an expression for the torque experienced by a dipole due to a uniform electric field.

6. Derive an expression for electrostatic potential due to or point charge.*

10. Obtain gauss law from coulomb's law?

17. Obtain the expression for capacitance or parallel plate capacitor?*

18. Obtain the expression for energy stored in the parallel plate capacitor?*

> ### 5mark:

4. Calculate the electric field due to a dipole on its axial line.***

7. Derive an expression for electrostatic potential due to an electric dipole.**

11. Obtain the expression for electric field due to an infinitely long charged wire.

20. Derive the expression for resultant capacitance, when capacitors are connected in series and in parallel.

22. Explain in detail the construction and working of a Van de Graff generator.

UNIT-2

> ### 2mark: - II

3. Distinguish between drift velocity and mobility.*

5. State macroscopic form ohm's law.

7. Define electrical resistivity.*

8. Define temperature coefficient of resistance.*

10. What is electric power and electric energy?*

11. Derive the expression for power Express P=VI in electric circuit.

20. What is Peltier effect?

> ### 3mark: - II & III

21. State the applications of Seeback effect. - **II**

3. Explain the equivalent resistance of a series and parallel resistor network. – III*

4. Explain the determination of the internal resistance of a cell using voltmeter. – III*

> ### 5mark: - III

1. Describe the microscopic model of current and obtain general form of ohm's law.*

6. Obtain the condition for bridge balance in wheatstone's bridge.***

UNIT -3

➤ **2mark: - II**

2. Define magnetic flux.

4. State coulomb's inverse law.*

6. State Biot-Savart's law.*

8. State ampere's circuital law.*

13. Define ampere.

15. Is an ammeter connected in series or parallel in a circuit? Why?

20. How is a galvanometer converted into (i) an ammeter and (ii) a voltmeter?

➤ **3mark: - III**

7. Find the magnetic field due to a long straight conductor using ampere's circuital law.*

11. Discuss the conversion of galvanometer into an ammeter and also a voltmeter.

14. Give the account of magnetic Lorentz force.

➤ **5mark: -III**

2. Deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current.***

3. Obtain a relation for the magnetic field at a point along the axis of a circular coil carrying current.*

13. Derive the expression for the force between two parallel, current – carrying conductors.*

16. Derive the expression for the force on a current – carrying conductor in a magnetic field.

UNIT-4

➤ **2mark : - II**

1. What is meant by electromagnetic induction?

4. State Fleming's right hand rule.*

6. Mention the way of producing induced emf.*

12. What are the step-up and step-down transformers?*

14. How will you define RMS value of an alternating current?*

18. How will you define Q-factor?*

21. What are LC oscillations?

➤ **3mark: - III**

8. What do you understand by self – inductance of a coil? Give its physical significance.*

10. An inductor of inductance L carries an electric current i. How much energy is stored while establishing the current in it?*

18. Mention the various energy losses in a transformer.

25. Prove that the total energy is conserved during LC oscillations.*

➤ **5mark: - III**

11. Show that the mutual inductance between a pair of coils is same ($M_{12} = M_{21}$).

17. Explain the construction and working of transformer.*

20. Find out the phase relationship between voltage and current in a pure inductive circuit.

21. Derive an expression for phase angle between the applied voltage and current in a series RLC circuit.*

UNIT – 5

➢ 2mark: - II

1. What is displacement current?*
2. What are electromagnetic waves?*
3. Write down the integral form of modified Ampere's circuital law.
6. What are Fraunhofer's lines? How are they useful in the identification of elements present in the sun? *

➢ 3mark: - III

3. Discuss the Hertz experiment.
9. Explain the types of absorption spectrum.

➢ 5mark: - III

1. Write down Maxwell equations in integral form.
6. Write down the properties of electromagnetic waves.
8. Explain the types of emission spectrum.*

UNIT-6

➢ 2mark: - II

5. State Snell's law/law of refraction.
7. What is principle of reversibility?
8. What is relative refractive index?
10. Why do stars twinkle?
25. What is dispersion?
27. What is Rayleigh's scattering?
28. Why does sky appear blue?
30. Why do clouds appear white?

➢ 3mark:

4. What is optical path? Obtain the equation for optical path. **- II**
9. Obtain the equation for apparent depth. - **II**
12. Obtain the equation for critical angle. - **II**
5. Obtain the equation for lateral displacement of light passing through a glass slab. - **III**

➢ 5mark: - III

1. Derive the mirror equation and the equation for lateral magnification.
2. Describe the Fizeau's method to determine the speed of light.
7. Obtain lens maker's formula and mention its significance.
8. Derive the equations for thin lens and for magnification.

UNIT-7

➢ 2mark: - II

5. Define Wavefront.
7. State Hyugen's principle?
11. What are coherent sources?
13. What is intensity (or) amplitude division?

16. What is diffraction?

23. What is Rayleigh's criterion?

32. State Brewster's law.

47. What is astigmatism? What is its remedy?

> ➤ **3mark:**

19. What is Fresnel's distance? Obtain the equation for Fresnel's distance. -**II**

20. Mention the differences between interference and diffraction. **- II**

30. State and obtain Malus' law. -**II**

31. List the uses of polaroids. – **II**

13. Explain about compound microscope and obtain the equation for the magnification. –**III**

> ➤ **5mark: - III**

1. Prove law of reflections using Huygens' Principle.

2. Prove law of refraction using Huygens' Principle.

5. Obtain the equation for band width in young's double slit experiment.

7. Discuss the diffraction at single slit and obtain the condition for nth minimum.

14. Obtain the equation for resolving power of microscope.

UNIT – 8

> ➤ **2mark: - II**

2. Define work function of a metal. Give its unit.

3. What is photoelectric effect?

6. How will you define threshold frequency?

7. What is a photocell? Mention the different types of photocells.

9. State de Broglie hypothesis.

11. A proton and an electron have same kinetic energy. Which one has greater de Broglie wavelength. Justify.

14. Define stopping potential.

15. What is surface barrier?

17. What is Bremsstrahlung?

> ➤ **3mark: - III**

5. List out the laws of photoelectric effect.

10. Give the construction and the working of photo emissive cell.

11. Derive an expression for de Broglie wavelength of electrons.

15. Give the applications of photocell.

> ➤ **5mark: - III**

3. Explain the effect of potential difference on photoelectric current.

8. Obtain Einstein's photoelectric equation with necessary explanation.

12. Briefly explain the principle and working of electron microscope.

13. Describe briefly Davisson – Germer experiment which demonstrated the wave nature of electrons.

UNIT – 9

➢ **2mark: - II**

1. What are cathode rays?
5. What is meant by excitation energy?
8. What is distance of closest approach?
9. Define impact parameter.
14. Define atomic mass unit.
16. What is mass defect?
17. What is binding energy of a nucleus? Give its expression.
18. Calculate the energy equivalent of 1 atomic mass unit.
26. Define curie.

➢ **3mark: - III**

3. Derive the energy expression for an electron is the hydrogen atom using Bohr atom model.
4. Discuss the spectral series of hydrogen atom.
8. Discuss the beta decay process with examples.
11. Discuss the properties of neutrino and its role in beta decay.

➢ **5mark: - III**

1. Explain the J.J. Thomson experiment to determine the specific charge of electron.
2. Discuss the Millikan's oil drop experiment to determine the charge of an electron.
10. Obtain the law of Radioactivity.
15. Describe the working of nuclear reactor with a block diagram.

UNIT – 10

➢ **2mark: - II**

1. Define forbidden energy gap.
3. What do you mean by doping?
4. Distinguish between intrinsic and extrinsic semiconductors.
14. What is meant by biasing? Mention its types.
18. What is rectification?
22. What is modulation?

➢ **3mark: - III**

3. Draw the circuit diagram of a half wave rectifier and explain its working.
12. State and prove De Morgan's first and second theorem.
17. List out the advantages and limitations of frequency modulation.

➢ **5mark: - III**

2. Explain the formation of depletion region and barrier potential in PN junction mode.
4. Explain the construction and working of a full wave rectifier.
9. Transistor functions as a switch. Explain.

UNIT – 11

➤ **2mark: - II**

3. Give any two examples for "Nano" in nature.

➤ **3mark: - II**

1.Distinguish   between   Nano   science   and   Nanotechnology.
4. Mention any two advantages and disadvantages of robotics.

➤ **5mark: - III**

3. Discuss the functions of key components in robotics?

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PLUS TWO PUBLIC EXAM EXPECTED PROBLEM-2022 (2m & 3m)

EXAMPLE PROBLEM Q.NO ONLY

2 MARK	3 MARK
UNIT 1 = 1.1,1.11, 1.24	1.2, 1.4, 1.13, 1.17, 1.20, 1.22
UNIT 2 = 2.1, 2.2, 2.5, 2.25, 2.26,	2.3 2.4, 2.6, 2.10, 2.11, 2.13, 2.24
UNIT 3 = 3.5, 3.15	3.14, 3.19, 3.22, 3.26, 3.25
UNIT 4 = 4.1, 4.11,4.20	4.7, 4.8, 4,10, 4.12, 4.14, 4.15, 4.16, 4.19, 4.21, 4.22,4.24
UNIT 5 = 5.2	5.1, 5.4
UNIT 6 = 6.1, 6.5,6.19	6.3, 6.6,6.18, 6.21, 6.22, 6.13
UNIT 7 = 7.4, 7.6, 7.11	7.1, 7.2, 7.14, 7.15, 7.17, 7.19, 7.20
UNIT 8 = 8.2, 8.9	8.3, 8.6, 8.7, 8.8
UNIT 9 = 9.1, 9.7, 9.12	9.2, 9.9, 9.15
UNIT 10 = 10.2, 10.5, 10.12	10.3,10.8

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