GOVERNMENT BOYS HR. SEC. SCOOL , AVALURPET , VILLUPURAM

CLASS - 12 PHYSICS MODEL TEST - 1 - MARKS ; 60

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I . Answer any Seven of the following. Q.No 9 Compulsory 7 * 2 = 14

1. State gauss law .
2. Find the heat energy produced in a resistance of 10 Ω when 5 A current flows through it for 5 minutes
3. How will you increase the current sensitivity of the galvanometer?
4. What are the methods of producing induced emf ?
5. What are electromagnetic waves?
6. State Rayleigh's scattering law.
7. Two independent monochromatic sources cannot act as coherent sources. why?
8. Define stopping potential.
9. Calculate the number of nuclei of carbon-14 undecayed after 22,920 years. If the initial number of carbon-14 atoms is 10,000. The half-life of carbon-14 is 5730 years.
10. What is Rectification?

II . Answer any Seven of the following. Q.No 12 Compulsory 7 * 3 = 21

11. Derive an expression for the torque experienced by a dipole due to a uniform electric field. .
12. Calculate the equivalent resistance for resisitors 4Ω, 6 Ω connected in series circuit which is connected to 24 V battery and also find the potential difference across each resistors in the circuit.
13. Explain the conversion of Galvanometer into an ammeter.
14. Derive an expression for energy stored in an inductor.
15. Write the uses of (i) IR rays , (ii) Radio Waves (iii) Microwaves

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16. Find the dispersive power of a prism if the refractive indices of flint glass for red, green and violet colours are 1.613, 1.620 and 1.632 respectively
17. State and prove Brewster's law.
18. Explain the construction and working of photo emissive cell.
19. Derive the energy expression for an electron in the n-th orbit of atom using Bohr atom model.
20. State and Prove Demorgans theorem.

III. ANSWER ALL THE QUESTIONS : **5 * 5 = 25**

21. (a) Calculate the electric field due to a dipole at a point on its axial line.

(OR)

(b) Derive the mirror equation.

22. (a) Explain the determination of unknown resistance using meter bridge.

(OR)

(b) Obtain Einstein's photoelectric equation with necessary explanation.

23. (a) Derive the expression for the force on a current-carrying conductor in a magnetic field

(OR)

(b) Discuss the diffraction at single slit and obtain the condition for n^{th} minimum and maximum.

24. (a) Show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating emf of one cycle

(OR)

(b) Explain the basic elements of electronic communication system with the necessary block diagram

25. (a) Write down Maxwell equations in integral form.

(OR)

(b) Derive radius of n^{th} orbit and velocity for an electron in the hydrogen atom using Bohr atom model.

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CLASS - 12 PHYSICS MODEL TEST - 2 - MARKS ; 60

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I . Answer any Seven of the following. Q.No 9 Compulsory **7 * 2 = 14**

1. State Couloumb`s law in electrostatics.
2. Define Drift velocity and mobility.
3. Define magnetic dipole moment. Write its unit.
4. State lenzs law.
5. Mention the types of optically active crystals with example.
6. Diffraction grating cannot be used for X-ray diffraction. Why?
7. Write the postulates of Bohr atom model.
8. Write a short note on Zener Breakdown.
9. The relative magnetic permeability of the medium is 2.5 and the relative electrical permittivity of the medium is 2.25. Compute the refractive index of the medium.
10. If the focal length is 150 cm for a lens, what is the power of the lens?

II . Answer any Seven of the following. Q.No 18 Compulsory **7 * 3 = 21**

11. Write the properties of Electric field lines.
12. Explain the equivalent resistance of a series resistor network.
13. The repulsive force between two magnetic poles in air is 9×10^{-3} N. If the two poles are equal in strength and are separated by a distance of 10 cm, calculate the pole strength of each pole.
14. How will you induce an emf by changing the area enclosed by the coil?
15. Write down the properties of electromagnetic waves.(any 6)
16. Derive the relation between f and R for a spherical mirror.
17. Differentiate between Fresnel and Fraunhofer diffraction.

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18. When light of wavelength 2200Å falls on Cu, photo electrons are emitted from it. Find (i) the threshold wavelength and (ii) the stopping potential. Given: the work function for Cu is $\phi 0$ = 4.65 eV.
19. Discuss the properties of neutrino and its role in beta decay.
20. Draw the circuit diagram of a half wave rectifier and explain its working

III. ANSWER ALL THE QUESTIONS. **5 * 5 = 25**

21. Derive an expression for electrostatic potential due to an electric dipole.

(OR)

Elaborate any two types of Robots with relevant examples.

22. Explain the equivalent resistance of a series and parallel resistor network.

(OR)

Derive an expression for the law of disintegration in radioactivity.

23. Explain in detail the principle ,construction, working of cyclotron.

(OR)

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

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

(OR)

Obtain the equation for resultant intensity due to interference of light.

25. Describe the function of a Zener diode as a voltage regulator.

(OR)

Describe the Fizeau's method to determine the speed light.

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CLASS - 12 PHYSICS MODEL TEST - 3 - MARKS ; 60

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I . Answer any Seven of the following. Q.No 9 Compulsory 7 * 2 = 14

1. What is electric dipole? Define electric dipole moment?
2. States joules law of heating.
3. State Curie Weiss law.
4. State Flemings right hand rule.
5. What are Fraunhofer lines?
6. What are the conditions for total internal reflection to take place?
7. State Huygens principle.
8. Define work function?
9. What is atomic mass unit.?
10. Write Demorgans theorem.

II . Answer any Seven of the following. Q.No 12 Compulsory 7 * 3 = 21

11. Derive an expression for electrostatic potential due to a point charge.
12. Explain the equivalent resistance of a parallel resistor network.
13. Give an account of magnetic Lorentz force.
14. Explain the various energy losses in a transformer.
15. Write the uses of (i) X-RAY, (ii) GAMMA RAY (iii) UV RAYS
16. Obtain the equation for critical angle in total internal reflection.
17. Discuss about pile of plates.
18. Derive an expression for de Broglie wavelength of electrons.
19. Discuss the alpha decay process with example.
20. What is an LED? Give the principle of its operation with a diagram.

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III. ANSWER ALL THE QUESTIONS. **5 * 5 = 25**

21. State gauss law. Obtain the expression for electric field due to an infinitely long charged wire.

(OR)

Describe the funcion of a transistor as an amplifier with the neat circuit diagram. Sketch the input and output wave forms.

22. How the emf of two cells are compared using potentiometer.

(OR)

Explain the JJ Thomson experiment to determine the specific charge of electron.

23. Derive the expression for the force between two parallel, current carrying conductors. Define – Ampere.

(OR)

Briefly explain the principle and working of electron microscope.

24. Explain the construction and working of a single - phase AC generator with necessary diagram.

(OR)

Explain about compound microscope and obtain the equation for the magnification.

25. Write down the properties of electromagnetic waves.

(OR)

Discuss the applications of Nanomaterials in various fields.

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CLASS - 12 PHYSICS MODEL TEST - 3 - MARKS ; 60

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I . Answer any Seven of the following. Q.No 9 Compulsory 7 * 2 = 14

1. What is action of points.?
2. State Kirchhoff's second law.
3. State Flemings left hand rule.
4. Define RMS value of Alternating current.
5. Write Short notes on X-Rays.
6. For an Astronaut sky appears dark. Give reason.
7. What are the conditions for obtaining clear and broad interference fringes?
8. What is surface barrier?
9. What is ionization potential?
10. What is Doping?

II . Answer any Seven of the following. Q.No 12 Compulsory 7 * 3 = 21

11. Obtain the expression for capacitance for a parallel plate capacitor.
12. Explain the principle of potentiometer.
13. Write the properties of Magnetic field lines.
14. Explain any three uses of Eddy current or Focault current.
15. Write notes on Ampere-Maxwell law.Explain the importance of Maxwell's correction.
16. Derive an equation for apparent depth.
17. Discuss about Nicol prism.
18. Explain the Applications of of X-Rays.
19. Explain the idea of carbon dating.
20. Transistor functions as a switch. Explain.

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III. ANSWER ALL THE QUESTIONS. **5 * 5 = 25**

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

(OR)

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

22. Obtain the condition for bridge balance in Wheatstone's bridge.

(OR)

Derive an expression for phase relationship between voltage and current in a AC circuit containing only a capacitor.

23. What is spectrum? Explain the types of absorption spectrum.

(OR)

Derive the equation for angle of deviation produced by a prism and thus obtain the equation for refractive index of material of the prism.

24. What is photoelectric effect. List out the laws of photoelectric effect.

(OR)

Discuss the functions of key components of in Robots.

25. Discuss the Millikan's oil drop experiment to determine the charge of the electron.

(OR)

Sketch the static characteristics of a common emitter transistor and bring out the essential features of input and output characteristics.

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CLASS - 12 PHYSICS MODEL TEST - 5 - MARKS: 60

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I . Answer any Seven of the following. Q.No 9 Compulsory 7 * 2 = 14

1. What is equipotential surface?
2. Define Specific resistance.
3. Define one ampere based on force between two current carrying conductors.
4. What is Wattless current?
5. Write Amperes maxwell law.
6. State the laws of reflection.
7. What is angle of polarization?
8. What is braking radiation?
9. Define one Curie.
10. What is Intrinsic semiconductor.? Give examples.

II . Answer any Seven of the following. Q.No 12 Compulsory 7 * 3 = 21

11. Obtain the expression for energy stored in the parallel plate capacitor.
12. Explain the applications of Joules law of heating..
13. Differentiate Soft and Hard Ferro magnetic materials.
14. What are the advantages and disadvantages of AC over DC?
15. Discuss the Hertz experiment.
16. What are mirage and looming?
17. What is Fresnel's distance? Obtain the equation for Fresnel's distance.
18. How do we obtain characteristic x-ray spectra?
19. What is distance of closest approach? Derive an expression for it.
20. Distinguish between avalanche breakdown and Zener breakdown.

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III. ANSWER ALL THE QUESTIONS. **5 * 5 = 25**

21. Explain in detail the construction and working of a Van de Graaff generator.

(OR)

Obtain the macroscopic form of Ohm's law from its microscopic form.

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

(OR)

Explain the construction and working of transformer. Define Efficiency

23. What is spectrum? Explain the types of emission spectrum.

(OR)

Obtain lens maker's formula and mention its significance.

24. Obtain the equation for path difference and bandwidth in Young's double slit experiment.

(OR)

What you mean by electron emission? Explain briefly various methods of electron emission.

25. Describe the working of nuclear reactor with a block diagram.

(OR)

Explain the construction and working of a full wave rectifier.

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