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| Bon Secours College for Women Nationally Accredited with “A” Grade by NAAC (Affiliated to Bharathidasan University, Trichy-24) Recognized by UGC Under Section 2(f) & 12 (B)    Vilar Bypass, Thanjavur-613 006. |

**DEPARTMENT OF PHYSICS**

**APPLIED PHYSICS**

**UNIT I**

**2marks**

1. What is an equipotential surface?
2. Define a parallel plane conductor.
3. Define equipotential surface.
4. Write any two uses of capacitors.
5. Give the principle of a conductor.
6. Define Electrostatic potential.
7. Define electric potential.
8. What is meant by action of points? Where is it made use of?
9. State Gauss’s theorem
10. What you mean by charged sphere?
11. List different types of capacitor?
12. What is a function of a capacitor?
13. Define a conductor.
14. Define electric field intensity.

**5marks**

1. State and explain Gauss theorem.
2. Write a note on “Action of Points”
3. State and prove Gauss theorem.
4. Explain the principle of capacitor.
5. Calculate the intensity at a point due to a uniformly charged cylinder.
6. Write notes on capacitor in series?
7. Explain energy loss due to sharing of charge.
8. Give the principle of capacitor. Derive an expression for the energy of a charged capacitor.
9. Calculate the resultant capacity of three capacitor connected in series and parallel.
10. Write a short note on equipotential surface.
11. Explain briefly about different types of capacitor.
12. Derive an expression for electrostatic potential.
13. Derive an expression for electric field intensity at a point due to charged sphere.
14. Derive an expression for electric field intensity at a point near an infinite plane charged conductor.

**10 marks**

1. State and explain Gauss theorem.
2. Write a note on “Action of Points”
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**UNIT II**

**2marks**

1. Define Magnetic flux density.
2. Bring out the importance of hysteresis curve.
3. What is magnetic shell?
4. What is Magnetic field?
5. When a material is said to be Ferromagnetic?
6. Define Magnetic potential.
7. What you mean by Hysteresis?
8. Explain the intensity of magnetic field. Write a relation connecting it with potential.
9. Define Hysteresis.
10. Explain the term “Hysteresis”.
11. What is coercitivity and retentivity?
12. Give two properties of a dia magnetic material.
13. Define magnetic susceptibility
14. Define a dipole.
15. What is susceptibility?

**5marks**

1. Derive the relation between Potential and Intensity.

2. Derive an expression for the Magnetic flux density.

3. Define and explain the term retentivity,coercivity and Hysteresis loop.

4. Give the properties of ferromagnetic substance.

5. What is the function of a magnetometer?

6. Derive the relation between susceptibility and permeability?

7. Derive potential at a point due to dipole.

8. Define the following terms (i) Permeability (ii) Susceptibility. Give the relation between µr and χ.

9. What do you mean by susceptibility? Establish a relation between permeability and susceptibility.

10. Describe Magneto meter method to draw I-H curve for a specimen.

11. How will you calculate hysteresis loss? Explain with theory.

12. Explain the theory of magnetism.

13. Explain about intensity of magnetization.

14. Establish the relation between magnetic susceptibility and magnetic permeability?

15. Distinguish between dia, para, and Ferro magnetic materials.

**10marks**

1. Calculate the magnetic potential of a Magnetic material at any point on the sphere.
2. Calculate the potential due to a Dipole.
3. Obtain an expression for potential at any point due to a magnetic shell.
4. Describe the magnetometer method of tracing the hysteresis curve for a sample of iron in the form of a long thin rod.
5. Give the properties of Dia, Para and Ferro magnetic materials.
6. Write a note on: (i) Retentivity (ii) coercivity
7. Explain domain theory of Ferro magnetism and also discuss energy loss from hysteresis loop.
8. State the properties of ferromagnetic materials. Explain with the help of the domain theory and also explain Curie temperature.
9. Describe the construction and working of a moving coil galvanometer. Explain how it may be used to measure electric charge.
10. Discuss the magnetometer method with relevant theory to determine hysteresis of a material.

**UNIT III**

**2 marks**

1. State Ohm’s law.
2. Define an Ampere.
3. State Kirchoff’s voltage law.
4. How galvanometer can be converted into an ammeter?
5. State Laplace’s law.
6. What is the unit of current?
7. State Fleming’s right hand rule.
8. What is the principle of a potentiometer?
9. Explain Fleming’s right hand rule.
10. State Fleming’s left hand rule.
11. Define Fleming’s left hand rule.
12. What is induced emf?
13. State Kirchoff’s laws.
14. Distinguish between a dead beat galvanometer and a ballistic galvanometer.

**5 marks**

1. State and explain Kirchoff’s laws. Obtain an expression for the condition of balance for the Wheatstone’s network.
2. How will you calibrate the given low range voltmeter using potentiometer?
3. Derive an expression for intensity at a point due to straight conductor carrying current.
4. Define (i) An ampere (ii) Resistance (iii) State Ohm’s law.
5. State and explain Laplace’s law.
6. Write short note with neat circuit diagram about Wheatstone bridge.
7. With an aid of a circuit diagram, explain the function of potentiometer.
8. How will you convert a galvanometer into an ammeter and a voltmeter? Explain.
9. Obtain the condition for bridge balance in Wheatstone’s bridge.
10. Explain the method to calibrate a given low range voltmeter using potentiometer.
11. Obtain intensity at a point due to a straight conductor.
12. Explain working of Ballistic galvanometer.
13. State and explain Fleming’s right hand rule.
14. What is an Ammeter useful for?
15. Write the theory of moving coil galvanometer.
16. Obtain an expression for the field at the center of a current carrying circular coil.

**10 marks**

1. Discuss in detail about transformer theory.
2. Give the principle and working of a Wheatstone’s bridge.
3. Discuss the working of a moving coil galvanometer.
4. Derive an expression for the intensity at a point due to a straight conductor carrying current.
5. Explain the principle and working of Carey foster bridge with Kirchhoff’s circuital theory.
6. Derive an expression for the magnetic induction due to a long straight conductor.
7. Explain how a low range voltmeter could be calibrated using a potentiometer.
8. State and explain Kirchoff’s laws with an application.
9. Calculate the field due to a solenoid at a point on its axis when current flows.
10. Describe the theory of Ballastic Galvanometer.

**UNIT IV**

**2marks**

1. State the laws of Faraday and Lenz for electromagnetic induction. Define turns ratio.
2. State the Faraday’s laws of electromagnetic induction.
3. Define Mutual inductance.
4. Define Mutual induction.
5. What is induced emf?
6. State down any two methods for determining Mutual inductance.
7. Outline the salient feature of parallel resonance circuit.
8. Define self inductance.
9. What is coefficient of coupling?
10. State the laws of Electromagnetic induction.
11. What is Eddy current?
12. State Lenz’s law.
13. Define mutual inductance between a pair of coils.
14. Define induced emf.
15. Define self induction.
16. What is inductance?

**5 marks**

1. State Laws of Electromagnetic Induction.
2. What is coefficient of coupling how will you determine it?
3. Deduce an expression for coefficient of coupling.
4. Derive the relation between induced emf and mutual inductance.
5. State and explain Faraday’s law electromagnetic induction.
6. Discuss the theory of transformer.
7. Write a note on Eddy currents.
8. Give the principle of a transformer.
9. Obtain an expression for the self inductance of a solenoid
10. Explain the various energy losses in a transformer.
11. State and explain the laws of electromagnetic induction.
12. Explain the laws of electromagnetic induction.
13. Write a short note on transformer.
14. Define the coefficient of mutual induction of the

pair of coils. Establish the relation between induced emf and mutual inductance.

15. What are called Eddy currents? Give their practical applications.

**10 marks**

1. Describe the theory of oscillatory discharge of a condenser.
2. Describe Anderson’s bridge method to fin the self inductance of the coil.
3. What is meant by coefficient of coupling? Obtain an expression for the coefficient of coupling between two coils.
4. State and explain the laws of electromagnetic induction.
5. How will you determine self inductance?
6. Discuss in detail about transformer theory?
7. What is the Absolute method useful for?
8. Give the working of a Transformer.
9. State and explain Faraday’s Laws of electromagnetic induction.
10. Derive an expression for self inductance.

**UNIT V**

**2marks**

1. What do you mean by resonance?
2. What is Wattless current?
3. Define alternating current.
4. What does A.C. stand for?
5. What do you mean by sharpness of resonance?
6. What is power factor in ac circuits?
7. What is sharpness of resonance? Explain.
8. Explain “watless current”.
9. Mention any two uses of choke coil.
10. Define form factor.
11. What do you mean by oscillatory discharge?
12. Outline the salient feature of parallel resonance circuit.
13. What is the difference between AC and DC current?
14. Define a condenser.
15. What is called impedance?
16. Distinguish between mean value, peak value and rms value of alternating current.

**5 marks**

1. Obtain an expression for the power in an A.C circuit. What is meant by power factor?
2. Compare the series resonance circuits. Explain the term resonance.
3. How can you measure current and voltage by AC circuits?
4. Compare the series and parallel resonance circuits. Explain the term resonance.
5. Write a note on AC circuits with double components.
6. How do parallel resonance circuits function?
7. Explain the performance of A/C circuits with single components.
8. Explain different functions of series resonance circuit.
9. Obtain the capacitive reactance of a AC circuit containing capacitance only.
10. Explain selectivity and sharpness of resonance.
11. Obtain an expression for the current in a circuit containing a pure inductance.
12. Define Peak, Mean and Root-Mean Square Value of an alternating voltage.
13. What is Q factor in an ac circuit and explain.
14. Write a note on parallel resonance circuit’s function.
15. Derive an expression for power factor.

**10 marks**

1. How will you measure Voltage in an A.C.? Circuit?
2. Write a note on selectivity and sharpness of resonance.
3. Give the working of series and parallel resonance circuits.
4. Write short notes on (i) Watless current (ii) Choke (iii) Power (iv) Q-factor.
5. What is a series resonant circuit? Arrive at the condition for resonance in a series LCR circuit.
6. Derive an expression for power.
7. Calculate the oscillatory discharge of a condenser.
8. What is a choke coil? Describe the construction and working of choke coil. give its uses.
9. Describe the theory of oscillatory discharge of a condenser.
10. Obtain expression for the growth and decay of the change of a conductor through a resistance. Find the conditions under which the discharge of condenser is oscillatory