PHYSICS

BOOKS - R G PUBLICATION

MAGNETISM AND MATTER

Exercise

1. What is Curie temperature of a ferromagnetic material? Give one example of a ferromagnetic material.

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2. What are hard ferromagnetic and soft ferromagnetic materials? Give one example of each.

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3. Deduce the expression for torque on a rectangular current loop in a uniform magnetic field.

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4. Distinguish among paramagnetic , ferromagnetic and diamagnetic materials qualitatively.

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5. Find the expression for mutual inductance between a pair of co-axial coils.

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6. A short bar magnet plaved with its axis at 30° with a uniform external magnetic field of 0.25T experiences a torque of $4.5 \times 10^{-2} J$. What is its magnetic moment?

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7. Define the elelemts of the earth's magnetic field.

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8. Define magnetization and magnetic intensity.

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9. From which source, the word 'magnet' is derived?

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10. State Gauss's law for magnetism.

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11. What is dynmo effect?

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12. What is geographic meridian?

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13. What is magnetic susceptibility?

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14. What is relative magnetic permiability?

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15. Write the expressions for magnetisation M and magnetic intesity H.

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16. What is diamagnetism?

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17. What is paramagnetism?

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18. What is Curie's law?

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19. Write the limitations of Curie's law.

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20. Alnico, an alloy of iron, aluminium, nickel, cobalt and copper are hard ferromagnets. Why?

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21. What are hard ferromagnetic and soft ferromagnetic materials? Give one example of each.

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22. Define curie temperature.

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23. Draw the B-H curve for ferromagnetic materials.

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24. What is retentivity ?

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25. What is coercivity?

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26. Write the units of magnetisation and magnetic intensity.

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27. What is the nature of magnetic susceptibility.

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28. Distinguish between magnetic dipole and electric dipole.

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29. What is a magnet?

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30. What is sure test of magnetism?

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31. Write the value of earth's magnetic field.

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32. What are limits of earth's magnetic field?

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33. What are limits of earth's magnetic field?

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34. Where is the vertical component of earth's magnetic field zero?

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35. Can we have a magnet with single pole?

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36. What is the significance of Gauss law in magnetism?

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37. On what factor pole strength of a magnet depend?

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38. Write mathematical form of tangent law in magnetism.

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39. Are the two pole of magnet equally strong?

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40. Deduce the expression for the magnetic dipole moment of a revolving electron.

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41. S.I. unit of magnetic dipole is

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42. What is the potential energy of a dipole when it is perpendicular to a magnetic field?

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43. Write a short note on "Bar magnet".

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44. Draw the magnetic field lines of a bar magnet.

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45. State Gauss's law.

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46. "The strength of the earth's magnetic field varies from place to place". Explain.

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47. Differentiate between magnetic equator and geographic equator.

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48. The earth's magnetic field at the equator is approximately 0.4G. Estimate the earth's dipole moment.

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49. Define magnetic declination.

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50. In the magnetic meridian of a certain place, the horizontal component of the eath's magnetic field is 0.26G and the dip angle is 60°. What is the magnetic field of the earth at this location?

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51. Distinguish between dia and paramagnetic substance.

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52. What is ferromagnetism? What are the ferromagnetic substance?

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53. "A soft iron core in solenoid acts as an electromagnet". Explain.

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54. In which direction would a compass free to move in the vertical plane point to, if located right on the geomagnetic north or south pole?

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55. "A system displaying a hystersis loop such as a ferromagnet, is a device for storing memory? Explain.

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56. Why is diamagnetism, in contrast, almost independent of temperature?

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57. Distinguish between magnetic dipole and electric dipole.

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58. Define tangent law in magnetism.

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59. What is meant by magnetic field and magnetic field intesity?

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60. Establish the Coulomb's law in magnetism.

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61. Compare the magnetic fields on a bar magnet and a solenoid.

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62. What is the probable cause of earth magnetism?

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63. Distinguish between permeability and susceptibility.

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64. Distinguish between dia and paramagnetic substance.

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65. Why magnetic field exist inside a magnet?

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66. When the intensity of magnetisation is said to be positive or negativE?

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67. What are the general properties of electric field lines?

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68. Show how the axial field of a finite solenoid resembles that of a bar magnet?

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69. Deduce an expression for magnetic potential energy in an uniform magnetic filed.

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70. What is magnetic field?

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71. The number of turns of solenoid is 800 per meter, If it carry a current of 1.8A. Calculate magnetic intensity and magnetisation. Given relative permiability $\mu r = 400$

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72. Deduce the expression for $\Phi_B = \sum_{\Delta S} B.\Delta S = 0$

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73. What is the Domain theory of ferromagnetism?

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74. Describe the properites of feromagnetism.

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75. What do you mean by permeability and susceptibility? How they are related with each other?

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76. A bar magnet of volume $40cm^3$ develop a magnetic monent 8000 gauss when placed a magnetic field. Calculate the intensity of magnetisation of the magnet.

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77. The horizontal component of earth magnetic field is 0.2 gauss and total magnetic field is 0.4 gauss find the angle of dip.

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78. A circular coil of 50 turns and diameter 8 cm carries a current 2 ampere. How much work will be done in rotating a coil through 180° when suspended in a uniform magnetic field $1wb/m^2$.

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79. Calculate angle of dip at a place, where horizontal and vertical component of earth's field are equal.

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80. What will be the value of vertical component and total intensity of earth field at

place where dip is 60°. Horizontal component is 0.3G.

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81. Deduce the expression for the magnetic dipole moment of a revolving electron.

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82. Discuss electron theory of magnetism.

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83. State and explain Curies law in magnetism.

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84. What is Hystersis. Draw the diagram.

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85. What do you mean by Hystersis loss.

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86. Why electromagnet made by soft iron explain?

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87. What is Bohr magneton?

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