



PHYSICS

BOOKS - OSWAAL PUBLICATION

PHYSICS (KANNADA ENGLISH)

2018 Solved Paper 3

Exercise

1. Who discovered the fact that amber rubbed with wool or silk attracts light objects?



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2. Define current density.



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3. What should be the angle between the velocity vector of the charged particle and the magnetic field to experience a maximum force, when a charged particle is moving in a uniform magnetic field?





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4. Write the relation between relative permeability and magnetic susceptibility of a magnetic material.



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5. State Lenz's law.



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6. An elderly person is facing difficulty while reading a book which is about 25cm distance from his eyes. Name the eye defect from which the person is suffering.



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7. Mention any three application of polaroids



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8. A graph of stopping potential of a photo sensitive metal with the frequency of incident radiation is plotted. What does the slope of this curve represent?



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9. How to get a steady d.c output from the pulsating d.c output of a full wave rectifier?



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10. Represent a typical analogue signal with a diagram



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11. Write Coulomb's law in vector form and explain the terms.



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12. Define relaxation time of conduction electrons. How it depends on the temperature of the conductor?



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13. State and explain Gauss's law in magnetism.



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14. A coil of self-inductance 2H is carrying a current of 2A . Calculate the energy stored in the coil.



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15. What was Marconi's invention in the field of electromagnetic waves? What for it is used now?



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16. Mention any two methods of increasing the resolving power of a microscope.



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17. What are isotopes? Give an example.



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18. A transistor is having a β equal to 80 has a change in base current of $250\mu A$. Calculate

the change in the collector current.



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19. Derive an expression for the electric potential energy of a system of two point charges in the absence of an external electric field.



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20. What is a cyclotron? Give the expression for cyclotron frequency and explain the terms.



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21. Mention any three properties of diamagnetic substance.



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22. Derive the expression for emf induced in a straight conductor moving perpendicular to a uniform magnetic field.



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23. What is meant by resonance in a series LCR circuit? Write the expression for the current through LCR series circuit at resonance. Mention any one application of resonant circuits.





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24. Obtain the relation between radius of curvature and focal length of a concave mirror with necessary ray diagram.



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25. Draw the schematic diagram of a nuclear reactor and label its parts. What is the function of a moderator in a nuclear reactor?



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26. Mention the three important reasons which necessitate the process of modulation in communication.



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27. Write the expression for electric field intensity at any point outside and inside due to a charged spherical shell.



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28. Deduce the condition for balance of a wheatstone's bridge using Kirchoffs rules .



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29. Obtain an expression for the force between two straight parallel conductor carrying current. Hence define ampere.



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30. Explain the theory of interference of light.



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31. Derive an expression for the total energy of an electron in stationary state of hydrogen atom. Assuming the expression for the radius.



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32. Explain the use Zener diode as a voltage regulator.



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33. A parallel plate capacitor has two plates of dimensions $10\text{cm} \times 7\text{cm}$ separated by a distance of 0.7 mm. A glass plate of thickness 0.4 mm (dielectric constant = 6) and another dielectric medium of thickness 0.3 mm (dielectric constant = 2.5) are placed between the plates of the capacitor. Calculate the capacitance of the capacitor before and after introduction of the dielectric media.



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34. A silver wire has a resistance of 2.1Ω at $27.5^\circ C$, and a resistance of 2.7Ω at $100^\circ C$. Determine the temperature coefficient of resistivity of silver. Also find the resistance of the silver wire at $0^\circ C$.



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35. A resistor of 200Ω , an inductor of 25 mH and a capacitor of $15.0 \mu\text{F}$ are connected in

series to a 220 V, 50 Hz ac source. Calculate the current through the circuit. Also find the phase difference between the voltage across the source and the current.



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36. A ball is approaching a convex mirror of focal length 30 cm with speed 20m//s. Calculate the speed of its image when the ball was at 5 m from the mirror?



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37. The threshold wavelength of photo sensitive metal is 5000 \AA .Find the velocity of the photoelectrons emitted by it when wavelength of 4000 \AA is incident on it.



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