



PHYSICS

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PHYSICS (KANNADA ENGLISH)

Sample Paper 3

Exercise

1. What is an electric dipole ?



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2. State Ampere's circuital law and represent it mathematically.



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3. Give any one use of electromagnet



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4. Name the rule which gives the direction of induced current in a conductor .



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5. What is the wavelength range of X-rays ?



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6. Write the expression for displacement current or Maxwell's displacement current.



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7. How is the power of lens related to its focal length ?



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8. Who proposed the wave nature of light?



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9. What is the SI unit of activity?



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10. Draw the circuit symbol of n-p-n transistor



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11. Mention and five properties of electric field lines.



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12. Give an expression for force acting on a charge moving in magnetic field and explain the symbols, when does the force become maximum.



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13. What is hysteresis? Define the terms 'coercivity' and 'retentivity' of a ferromagnetic material.





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14. What are eddy currents ? Mention two applications of eddy currents.



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15. What is a thin prism? Write its deviation expression.



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16. How do you represent plane polarized and unpolarised light ?



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17. Define half life of a radioactive element and deduce the expression for the same .



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18. Give three differences between intrinsic and extrinsic semiconductors



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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. State and explain Ohm's law and hence define ohm.





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21. Write any four properties of ferromagnetic materials and give an example for it.



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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. State any three features of nuclear force



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24. Distinguish between conductors, insulators and semiconductors on the basis of band theory.



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25. Draw a neat labelled block diagram of an AM transmitter.



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26. Derive an expression for the electric field at a point due to an infinitely long thin charged straight wire using Gauss Law.



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27. Obtain an expression for equivalent resistance of two resistors connected in parallel.



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28. Derive the expression for magnetic field at a point on the axis of a circular current loop.



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29. Derive the expression for refractive index of the material of the prism in terms of angle of the prism and angle of minimum deviation.



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30. Explain three facts of photoelectric effect using Einstein's photoelectric equation.



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31. With a circuit diagram, explain the action of n-p-n transistor as an amplifier in CE mode.



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32. A 400 pF capacitor charged by a 100 V dc supply is disconnected from the supply and connected to another uncharged 400 pF capacitor calculate the loss of energy



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33. (a) Three resistors 1Ω , 2Ω , and 3Ω are combined in series. What is the total resistance of the combination ?

(b) If the combination is connected to a battery of emf 12 V and negligible internal resistance, obtain the potential drop across each resistor.



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34. A series LCR circuit with our 20Ω , $L = 1.5\text{ H}$ and $C = 35\mu\text{F}$ is connected to a variable

frequency of 200 V a.c. supply when the frequency of the supply is equal to the natural frequency of the circuit what is the average power transferred to the circuit in one complete cycle.



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35. Monochromatic light of wavelength 5000\AA from a narrow slit is incident on the double slit. If the separation of 10 fringes on the

screen 1 m away is 2 cms. Find the slit separation.



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36. Calculate the shortest and longest wavelength of Balmer series of hydrogen atom. Given $R = 1.097 \times 10^7 / m$



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