



PHYSICS

BOOKS - OSWAAL PUBLICATION

PHYSICS (KANNADA ENGLISH)

Sample Paper 8

Exercise

1. A plane electromagnetic wave travels in vacuum along z-direction. What can you say

about the directions of its electric and magnetic field vectors? If the frequency of the wave is 30 MHz, what is its wavelength?



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2. Which diode is used as photodetector?



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3. What is the colour of the third band of a coded resistor of resistance $2.3 \times 10^2 \Omega$?



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4. Name the EM waves used for studying crystal structure of solids. What is its frequency range?



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5. What was the scattering angle in Rutherford's experiment?



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6. What is a node?



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7. What is the thin prism?



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8. Name the three basic elements for communication ?





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9. What are alpha particles ?



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10. How does a diamagnetic material behave when it is cooled to very low temperature?



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11. Why does a paramagnetic sample display greater magnetisation (for the same magnetising field) when cooled ?



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



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13. When electrons drift in a metal from lower to higher potential, does it mean that all the free electrons of the metal are moving in the same direction?



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14. State Rayleigh's criterion for two close lying points on an object when they are unresolved



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15. State Rayleigh's criterion for two close lying points on an object when they are: just resolved.



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16. Why there is a need for modulation ?



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17. Mention two uses of a capacitor.



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18. Current in a coil falls from 2.5a to 0.0a in 0.1 second inducing an emf of 200v.calculate the value of self inductance .



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19. what is photo diode? Mention its one use.



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20. How is galvanometer converted into an ammeter?



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21. Obtain the expression for the energy stored in a charged parallel plate capacitor and express it in its three equivalent forms, in terms of capacitance C , charge Q on the plate

and potential difference V between the plates.

Use this result to show that the energy density, of the electric field E , in a capacitor equals $\frac{1}{2} \epsilon_0 E^2$.



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22. If r_1 and r_2 represent radii of two concentric coil ($r_2 > r_1$) then give the expression for the coefficient of mutual inductance for the pair of coils.



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23. Classify metals, semiconductors and insulators on the basis of energy bands.



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24. State Brewster's law . Show that the reflected and refracted rays are normal to each other at the polarising angle of incidence.



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25. A parallel plate capacitor is charged to a potential difference V by a d.c. source. The capacitor is then disconnected from the source. If the distance between the plates is doubled, state with reason how the following will change: electric field between the plates



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26. A parallel plate capacitor is charged to a potential difference V by a d.c. source. The

capacitor is then disconnected from the source. If the distance between the plates is doubled, state with reason how the following will change: capacitance



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27. A parallel plate capacitor is charged to a potential difference V by a d.c. source. The capacitor is then disconnected from the source. If the distance between the plates is

doubled, state with reason how the following will change: energy stored in the capacitor.



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28. Give three characteristics of photon.



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



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30. (a) Draw a labelled ray diagram of an astronomical telescope to show the image formation of a distant object. Write the main consideration required in selecting the objective and eyepiece lenses in order to have large magnifying power and high resolution of the telescope.

(b) A compound microscope has an objective of focal length 1.25cm and eyepiece of focal length 5 cm. A small object is kept at 2.5 cm

from the objective. If the final image formed is at infinity, find the distance between the objective and the eyepiece.



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31. Write three distinct advantages of a reflecting type telescope over a refracting type telescope.



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



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33. Draw a plot of potential energy of a pair of nucleons as a function of their separations. Mark the regions where the nuclear force is (i) attractive and (ii) repulsive. Write any two characteristic features of nuclear forces.

OR

Draw a plot of potential energy of a pair of nucleons as a function of their separation. Write two important conclusions which you can draw regarding the nature of nuclear forces.



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34. Draw the block diagram of generalised communication system.



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35. What is meant by .detection. of a modulated carrier wave? Describe briefly the essential steps for detection.



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36. A resistor of 100Ω , inductance of 1 H and a capacitor of capacitance 10.13×10^{-6} F are in series. This combination is connected to an A.C source of 200 V, 50 Hz. Find this current in the circuit and the p.d. across the resistor.



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37. The ground state energy of hydrogen atom is -13.6 eV. If an electron makes a transition from an energy level -0.85 eV to -3.4 eV, calculate the wavelength of the spectral line emitted. To which series of hydrogen spectrum does this wavelength belong?



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