



PHYSICS

BOOKS - JEEVITH PUBLICATIONS

PHYSICS (KANNADA ENGLISH)

**ANNUAL EXAMINATION QUESTION
PAPER (WITH ANSWER) MARCH 2018**

Part A

1. What is an equipotential surface ?



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2. Define 'drift velocity' of free electrons .



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3. Write any one application of the cyclotron.



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4. State Faraday's law of electromagnetic induction.



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5. If the peak value of a.c. current is $4.24A$, what is its root mean square value ?



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6. What is a transformer ? Mention two sources of energy loss in a transformer



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7. Two lenses of power $+1.5D$ and $-0.5D$ are kept in contact on their principal axis . What is the effective power of the combination ?



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8. The decay of proton to neutron is possible only inside the nucleus. Why ?

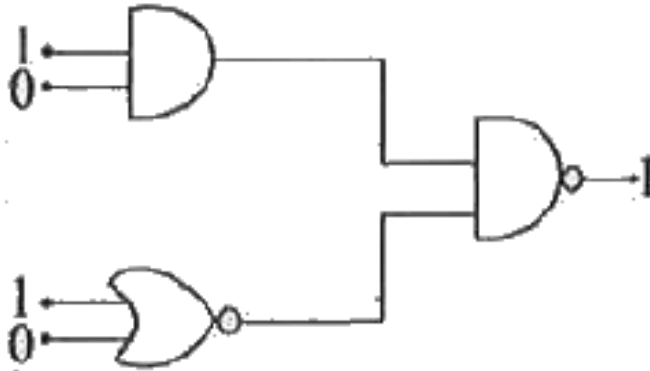


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9. What is 'depletion region' in a semiconductor diode?



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10.

What is the output of this combination?



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Part B

1. Mention any two factors on which the capacitance of a parallel plate capacitor depends.



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2. State Kirchhoff's laws of Electrical network.



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3. Define magnetic declination.



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4. Write an expression for magnetic potential energy of a magnetic dipole kept in a uniform magnetic field and explain the terms.



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5. Give any two applications of X -rays.



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6. What is 'myopia' ? How to rectify it?



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7. Draw the diagram representing the schematic arrangement of Geiger-Marsden experimental alpha particle scattering.



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8. What are the characteristics of nuclear forces?



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Part C

1. Mention any three properties of an electric charge.



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2. State Ampere's circuital law . Using it, derive the expression for magnetic field at a point due to a long current carrying conductor .



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



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4. Arrive at Snell's law of refraction, using Huygen's principle for refraction of a plane wave.



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5. Write Bohr's postulates for the hydrogen atom model.



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6. Derive an expression for the half-life of a radio active nuclide.



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7. Distinguish between p type and n type semiconductors



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8. Draw the block diagram of a generalised communication system.



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9. A circular coil of radius 10cm and 25 turns is rotated about its vertical diameter with an angular speed of 40rads^{-1} , in a uniform horizontal magnetic field of magnitude $5 \times 10^{-2}\text{T}$. Calculate the maximum emf induced in the coil. Also find the maximum

current in the coil if the resistance of the coil is 15Ω .



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10. In Young's double slit experiment the slits are separated by 0.28mm and the screen is placed at a distance of 1.4m away from the slits. The distance between the central bright fringe and the fifth dark fringe is measured to be 1.35cm . Calculate the wavelength of the light used. Also find the fringe width if the

screen is moved towards the slits by $0.4m$, for the same experimental set up.



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11. Light of frequency $8.41 \times 10^{14} Hz$ is incident on a metal surface. Electrons with their maximum speed of $7.5 \times 10^5 ms^{-1}$ are ejected from the surface. Calculate the threshold frequency for photoemission of electrons. Also find the work function of the metal in electron volt (eV). Given Plank's

constant $h = 6.625 \times 10^{-34} Js$ and mass of the electron $9.1 \times 10^{-31} kg$.



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