PHYSICS

BOOKS - JEEVITH PUBLICATIONS PHYSICS (KANNADA ENGLISH)

MODEL QUESTION PAPER

Part A

1. Draw the electric lines of force in the case of two positive point charges separated by a

small distance.

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2. Name the charge carriers in metallic conductors.

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3. A coil perpendicular to a uniform magnetic field is rotated by 180. What is the change in the flux through it?

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4. Whrite the expression for displacement current or Maxwell's displacement current.

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5. Mention one common method of generating X-rays.

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6. Write the expression for magnifying power of a telescope in terms of focal lengths.

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7. What is the outcome of Davission Germer Experiment?

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8. How does nuclear radius of an atom depend on its mass number ?

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9. Who discovered the phenomenon of photoelectric effect?

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10. What is demodulation?

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Part B

1. Mention any three properties of an electric charge.

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2. What is an electrostatic shielding? Mention its one application.


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3. State kirchhoff's laws of electrical network


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4. Write three properties of diamagnetic and ferromagnetic materials


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5. Mention any three application of eddy currents.

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6. Draw the ray diagram to construct an image when an object is placed between the principal focus and pole of a concave mirror.

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7. Mention two necessary conditions for doping.

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

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Part C

1. Arrive at the expression for electric potential at a point due to a dipole and hence apply the expression for electric potential at a point on the dipole axis and on the equatorial lines.

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2. Obtain the expression for effective capacitance of two capacitors connected in parallel.

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3. What is a cyclotron?

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4. Describe the coil and barmagnet experiment to demonstrate the phenomenon of electromagnetic induction.

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5. What is meant by alternating current? Define its ampliude and time period.

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6. Using Huygens principle, show that the angle of incidence is equal to angle of reflection during a plane wave front reflected by a plane surface.

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7. Write any three experimental observations of photoelectric effect

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8. Classify metals, semiconductors and insulators based on the band theory of solids.

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Part D

1. Obtain an expression for the equivalent emf and internal resistance of two cells connected in parallel.

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2. State and explain Biot-Savart's law and give its mathematical equation in vector form.

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3. Show that a current carrying solenoid is equivalent to a bar magnet.

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4. 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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5. State the law of radioactivity and hence, show that $N = N_0 e^{-\lambda t}$.

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6. What is a solar cell? Explain its working with a neat labelled diagram. Draw the I - V characteristics for a solar cell.

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7. The electrostatic force on a metal sphere of charge $0.4\mu C$ due to another identical metal sphere of charge $-0.8\mu C$ in air is 0.2N. Find the distance between the two spheres and also the force between the same two spheres when they are brought into contact and then replaced in their initial positions.

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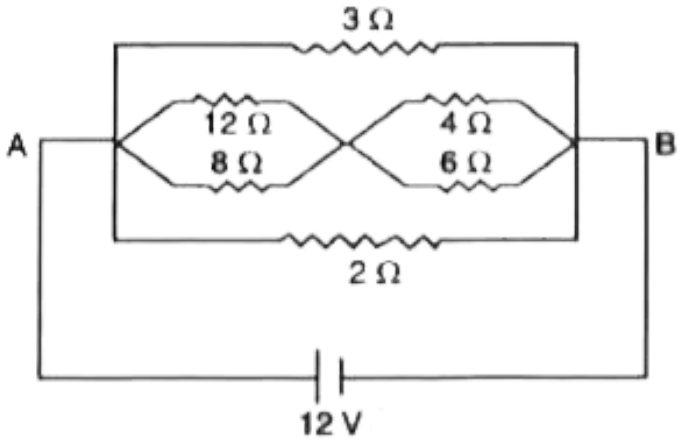
8. In the given circuit , calculate the (i) effective resistance between A and B (ii) current through the circuit and (iii) current through 3Ω resistor.



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9. A resistor, an inductor and a capacitor are connected in series with a 120 V, 100 Hz ae source. Voltage leads the current by 35° in the circuit. If the resistance of the resistor is 10Ω and the sum of inductive and capacitive reactances is 17Ω, calculate the self-inductance of the inductor.

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10. A beam of light consisting of two wavelengths 500 nm and 400 nm is used to obtain interference fringes in Young's double slit experiment. The distance between the slits is 0.3 mm and the distance between the slits and the screen is 1.5 m. Compute the least distance of the point from the central maximum, where the bright fringes due to both the wavelengths coincide.

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11. The first member of the Balmer series of hydrogen atom has wavelength of 656.3 nm. Calculate the wavelength and frequency of the second member of the same series. Given, $c = 3 \times 10^8 m/s$.

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