PHYSICS

BOOKS - JEEVITH PUBLICATIONS PHYSICS (KANNADA ENGLISH)

SUPER MODEL QUESTION PAPER -1

Part A

1. Define charge on a body.

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2. Mention the S.I. unit of current.

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3. State Lenz's law.

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4. Write an expression for the speed of propagation of electromagnetic wave in terms

of permittivity and permeability of free space .

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5. Name one source for visible rays.

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6. What are paraxial rays ?

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7. Define the terms :

Threshold frequency

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8. Mention the different methods of electron emission .

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9. What is nuclear fusion ?

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10. What is the signal bandwidth offered by a co - axial cable ?

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Part B

1. State and explain coulomb's law properties of equipotential surface .

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2. Write two properties of equipotential surfaces.

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3. State and explain ohm's law

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4. Define the terms (a) electromagnet (b) coercivity

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5. state faraday's laws of electromagnetic induction . Express then mathematically .

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6. Write any two applications of total reflection prisms .

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7. Explain the working of a zener diode as a voltage regulator.

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8. Explain the terms 'range ' and ' band width ' used in electronic communication systems.

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Part C

1. The effective capacitance of two capacitors connected in series is

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2. Derive a relation between electric field and potential

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3. Derive a relation between electric field and potential

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

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5. Derive the law of reflection of light on the basis of Huygens wave theory.

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6. Distinguish between p type and n type semiconductors

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7. Obtain the expression for current in case of AC applied to an inductor .

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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. What is a solenoid ? Derive an expression for the magnetic field at a point well within the current carrying solenoid.

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3. Find an expression for the torque acting on a magnetic dipole placed in an uniform magnetic field . Hence define magnetic dipole moment .

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4. Derive th lens maker's formula.

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

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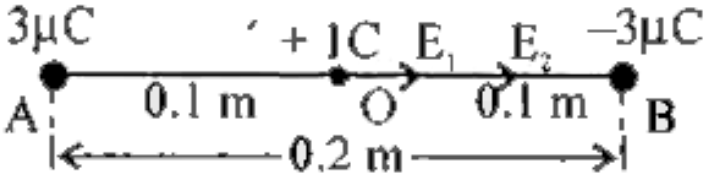
7. Two point charges $q_A = 3\mu C$ and $q_B = -3\mu C$ are located 0.2 m apart in vacuum.

a. What is the electric field at the mid point O of the line AB joining the two charges?

b. If a negative test charge of magnitude $1.5 \times 10^{-9} C$ is placed at this point, what is the force experienced by the test charge?



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8. Three resistors $2\Omega, 4\Omega$ and 5Ω are connected in parallel. What is the total resistance of the combination?

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9. If the combination is connected to a battery of emf 20 v and negligible internal resistance determine the current through each resistor , and the total current drawn from the battery .

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10. A radio can be tuned over the frequency range of a portion of μ broad cast band (800 kHz to 1200 kHz) . If its LC circuit has an effective inductance of 200 μ H , what must be the range of its variable capacitor?

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11. In Young.s double slit experiment, using monochromatic light of wavelength λ, the

intensity of light at a point on the screen where path difference is λ is K units. The intensity of light at a point where path difference is $\lambda/3$ is.

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12. It is found that an electron in an hydrogen atom requires +13.6 ev of energy to jump from the innermost level to the outermost energy level .Calculate the radius of the innermost orbit and the velocity in that orbit .

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