PHYSICS

BOOKS - JEEVITH PUBLICATIONS PHYSICS (KANNADA ENGLISH)

SUPER MODEL QUESTION PAPER -4

Part A

1. What is an electric field line ?

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2. Define temperature coefficient of resistance of a conductor. Give the expression for temperature coefficient.

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3. State Lenz's law.

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4. Write one use of x - rays .

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5. Write an expression for frequency of electromagnetic wave .

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6. Define reflection and refraction of light.

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7. Define work function of a metal .

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8. What are matter waves ?

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9. Define binding energy of a nucleus .

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10. What is demodulation ?

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Part B

1. Define dipole moment.

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2. How will you increase the capacitance of a parallel plate capacitor ?

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3. What is ferromagnetism? Give examples.

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

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5. State the laws of reflection.

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6. State the laws of reflection of light.

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7. Draw the block diagram of generalised communication system.

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Part C

1. Derive a relation between electric field and potential

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2. Derive the expression for energy stored in a charged capacitor.

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

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

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5. What is full wave rectification? Explain the working of a full wave rectifier. Indicate the wave forms of input and output voltage.

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Part D

1. Derive the expression for current when number of cells are connected in parallel .

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

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3. Write the expression for the magnetic field at a point on the axis of a long solenoid carrying current and give the meaning of the symbols used.

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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 radioactive decay law. Derive $N = N_0 e^{-\lambda t}$ for a radioactive element

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

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7. A conducting sphere of radius 10 cm has an unknown charge if the electric field 20 cm from the centre of the sphere is 1.5×10^3 N/C and points radialy inward what is the net charge on the sphere

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8. At room temperature $(27.0^{\circ}C)$ the resistance of a heating element is 100Ω. What is the temperature of the element if the resistance is found to be 117Ω. given that the temperature coefficient of the material of the resistor is $1.70 \times 10^{-4\circ}C^{-1}$.

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9. 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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10. Light of wavelength 5000Å falls on a plane reflecting surface. What are the wavelength and frequency of the reflected light? For what angle of incidence is the reflected ray normal to the incident ray?

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11. A hydrogen atom initially in the ground level absorbs a photon, which excites it to the n = 4 level. Determine the wavelength andfrequency of photon.

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