PHYSICS

BOOKS - OSWAAL PUBLICATION

PHYSICS (KANNADA ENGLISH)

SOLVED PAPER (II PUC JULY 2016)

Part A

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1. Give the SI unit of Electric field intensity.

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2. Give the expression for the magnetic force on a moving charge in an uniform magnetic field. What will be the maximum magnetic force on the moving charge?

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3. Where on the earth.s surface is the magnetic dip zero ?

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4. State Curie's law for a paramagnetic substance.

5. State Lenz's law.

6. Write the formula for Law of Malus

7. What is the ratio of the nuclear densities of two nuclei having mass numbers in the ratio 1:3 ?

8. Define β_{dc} of a transistor.

9. Write the truth table of NAND gate.

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10. Why sky wave propagation is not possible for wave having frequency more than 30 MHz ?

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Part B

1. Represent electric field lines around (i) a positive point charge (ii) a negative point charge and (iiii) an electric dipole.

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2. A galvanometer having a coil of resistance $12 \, \Omega$ gives full scale deflection for a current of 4 mA. How can it be converted into a voltmeter of range 0 to 24V.

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3. Distinguish between paramagnetic and ferromagnetic substances.

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4. What si meant by Self inductance and Mutual Inductance ?

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5. Express velocity of electromagnetic wave in a material medium in terms of μ and ε.

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6. Write the relation between the path difference and wavelength of light wave used for constructive and destructive interference of light

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7. Define: i) photoelectric work function ii) electron volt (eV)

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8. What is modulation ? Write the block diagram of the receiver.

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Part C

1. Derive an expression for potential energy of a system of three charges in the absence of external electric field.

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2. Arrive at an expression for drift velocity.

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3. State and explain Gauss's law in magnetism.

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4. Derive the expression for emf induced in a straight conductor moving perpendicular to a uniform magnetic field.

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5. With a diagram, explain the working of a transformer.

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6. What is total internal reflection? Mention two applications of optical fibres.

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7. What are matter waves? Derive an expression for the de Broglie wave length.

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8. Give three defferences between n-type and p-type semiconductors.

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Part D

1. Derive an expression for the electric field at a point due to an infinitely long thin charged straight wire using Gauss Law.

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2. Deduce the condition for balance of a wheatstone's bridge using Kirchoffs rules .

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3. Obtain an expression for the force between two straight parallel conductor carrying current. Hence define ampere.

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4. Derive th lens maker's formula.

5. Obtain an expression for the total energy of an electron in the nth orbit of hydrogen atom in terms of absolute constants.

6. When the transistor is used as an amplifier

7. Charges 2mC, 4mC and 6mC are placed at the three corners A, B and C respectively of a square ABCD of side x metre. Find, what charge must be placed at the fourth corner so that the total potential at the centre of the square is zero.

8. A wire having length 2.0 m diameter 1.0 mm and resistivity $1.963 \times 10^{-8}\Omega$ m is connected in series with a battery of emf 3V and internal resistance 1Ω. Calculate the resistance of the wire and current in the circuit.

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9. An inductor and a bulb are connected in series to an AC source of 220V, 50Hz. 7C A current of 11A flows in the circuit and phase

angle between voltage and current is $\dfrac{\pi}{4}$ radians. Calculate the impedance and inductance of the circuit

10. In Young's double slit experiment while using a source of light of wavelength 4500 A, the fringe width is 5mm. If the distance between the screen and the plane of the slits is reduced to half, what should be the wavelength of light to get fringe width 4mm?

11. The activity of a radioactive substance is 4700 per minute. Five minute later the activity is 2700 per minute. Find

(a) decay constant and

(b) half-life of the radioactive substance.