# PHYSICS

# BOOKS - SUNSTAR PHYSICS (KANNADA ENGLISH)

# [II PUC PHYSICS] ANNUAL EXAM QUESTION PAPER MARCH-2016

Part A Answer All The Following Questions

**1.** State Faraday's law of electromagnetic induction.

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**2.** Whrite the expression for displacement current or Maxwell's displacement current.

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**3.** What is an electric dipole ?

**4.** Draw the circuit symbol of p-n- p transistor.

**5.** How can the resolving power of a telescope

be increased ?

**6.** In the following nuclear reaction, identify the particle X.

$$n \top + e^- + X$$
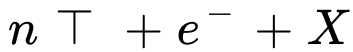
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**7.** Define magnetisation of a sample.

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**8.** How is the power of lens related to its focal length ?

**9.** What is a cyclotron?

**10.** What is the wavelength range of X-rays ?

**1.** The current in coil of self inductance 5 mH changes from 2.5 A to 2.0 A is 0.01 second. Calculate the value of self induced e.m.f.

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**2.** What is toroid? Mention an expression for magnetic field at point inside a toroid.

**3.** Write the difference between isotope and isobars.

**4.** Draw the variation of magnetic field(B) with magnetic intensity(H) when ferromagnetic material is subjected to a cycle of magnetisation.

**5.** Mention any three application of polaroids

**6.** Give the logic symbol, Boolean expression and truth table of a NAND gate?

**7.** Mention and five properties of electric field lines.

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**8.** What is 'myopia' ? How to rectify it?

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Part C Answer Any Five Of The Following Questions

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

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**2.** What are the characteristics of nuclear forces?

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**3.** Derive the expression for energy stored in a charged capacitor.

**4.** What is an amplifier? Draw the simple circuit of transistor amplifier in CE mode.

**5.** Mention the types of transmission media.

**6.** Arrive at an expression for drift velocity.

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

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**8.** Write any five properites of ferromagnetic materials

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

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

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**3.** Derive an expression for electric field due to an electric dipole at a point on the axial line.

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**Part D Answer Any Two Of The Following**

**1.** Write the experimental observations of photoelectric effect.

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**2.** What is rectification? With relevant circuit diagram and waveforms explain the working of P-N junction diode as a full-Wave rectifier.

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**3.** Derive the expression for effective focal length of two thin lenses kept in contact.

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**1.** In Young's double slit experiment, fringes of certain width are produced on the screen kept at a certain distance from the slits. When the screen is moved away from the slits by 0.1m,

fringe width increases by $6 \times 10^{-5} m$. The separation between the slits is 1 mm. calculate the wavelength of the light used.

**2.** When two capacitors are connected in series and connected across 4kV line, the energy stored in the system is 8 J. the same capacitors, if connected in parallel across the same line, the energy stored in 36 J. find the individual capacitances.

**3.** Calculate the shortest and longest wavelength of Balmer series of hydrogen atom. Given $R = 1.097 \times 10^7 m^{-1}$.

**4.** Calculate the resonent frequency of Q-factor (Quality factor) of a series L-C-R circuit containing a pure inductor of inductance 4H,

capacitor of capacitance 27 $\mu F$ and resister of resistance 8.4$\Omega$.

5. (a) Three resistors of resistance 2$\Omega$, 3$\Omega$ and 4$\Omega$ are combined in series. What is the total resistance of the combination ?

(b) It this combination is connected to a battery of emf 10 V and negligible internal resistance, obtain the potential drop across each resistor.