PHYSICS

BOOKS - SUNSTAR PHYSICS (KANNADA ENGLISH)

II PUC PHYSICS (SUPPLEMENTARY EXAM QUESTION PAPER JULY - 2018)

Part A

1. State Ohm's law.

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2. Define current sensitivity of a moving coil galvanometer.

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3. Write the expression for force experienced by a straight conductor of length L carrying a steady current I, moving in a uniform external magnetic field B.

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4. Define the term retentivity or remanence.

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

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6. State Lenz's law.

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7. Write the condition for .resonance. of series LCR circuit.

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8. What is wattless current?

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9. A blue ray of light enters an optically denser medium from air. What happens to its frequency in denser medium ?

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Part B

1. ${}_{92}U^{238}$ undergoes α-decay giving rise to thorium. What is the mass number of the

daughter nuclide ?

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2. Draw the graphs representing the variation of resistivity with temperature for (1) copper (2) nichrome (3) a typical semiconductor.

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3. What is a cyclotron? Give the expression for cyclotron frequency and explain the terms.

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4. State and explain Charles' law

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5. Mention any two factors on which the self inductance of a coil depends.

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6. Give any two applications of ultraviolet radiations.

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7. What is polarisation of light ? Name any one method of producing plane polarised light.

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8. Calculate de Broglie wavelength associated with an electron moving with a speed of $2 \times 10^5 ms^{-1}$. Given $h = 6.625 \times 10^{-34} JS, m_e = 9.11 \times 10^{-31} kg$.

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9. What is a light emitting diode? Write an advantage of using it over conventional low power lamps.

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Part C

1. Mention and five properties of electric field lines.

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2. Obtain an expression for equivalent resistance of two resistors connected in a series combination.

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3. Distinguish between diamagnetic and paramagnetic substances.

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

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

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6. Write any three experimental observations of photoelectric effect

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

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8. Draw block diagram of a reciever

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Part D

1. Write the expression for electric field intensity at any point outside and inside due to a charged spherical shell.

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2. Derive $\sigma = \frac{ne^2\tau}{m}$

where the symbols have their usual meaning.

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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. Describe with suitable block diagrams, action of pn-junction diode under forward and reverse bias conditions. Also draw I-V characteristics.

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5. Obtain an expression for the total energy of an electron in the n^{th} orbit of hydrogen atom in terms of absolute constants.

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6. The plates of a parallel plate capacitor have an area of $100cm^2$ each and are separated by 3mm. The capacitor is charged by connecting it to a 400 V supply.

(a) Calculate the electrostatic energy stored in

the capacitor.

(b) If a dielectric of dielectric constant 2.5 is introduced between the plates of the capacitor then find the electrostatic energy stored and also change in the energy stored.

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7. In the given circuit diagram, calculate : (i) The main current through the circuit and (ii) Also current through 9Ω resistor.

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8. A 20Ω resistor, 1.5 H inductor and $35\mu H$ capacitor are connected in series with a 220 V, 50 ac supply. Calculate the impedance of the circuit and also find the current through the circuit.

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9. The radii of curvatore of two surfaces of a convex lens is 0.2 m and 0.22 m. Find the the

forcal length of the lens if refractive index of the material of lens is 1.5. Also find the change in focal length, if it is immersed in water of refractive index 1.33.

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10. The half life of $_{38}Sr^{90}$ isotope is 28 years. What is the rate of disintegration of 15 mg of this isotope? (Given Avogadro No $= 6.023 \times 10^{23}$)

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