



PHYSICS

BOOKS - SUNSTAR PHYSICS

(KANNADA ENGLISH)

**II PUC PHYSICS SUPPLEMENTARY
EXAM QUESTION PAPER JULY - 2017**

Part A | Answer All The Following Questions

1. How does the electrostatic force between two point charges change, when a dielectric medium is introduced between them ?



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2. State Kirchoff's junction rule.



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3. What is Lorentz force ?



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4. Write the relation connecting rms value and Peak value of alternating current.



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5. What is motional electromotive force ?



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6. Mention the power factor of a pure inductor or a capacitor.



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7. Define half life of a radiocative sample.



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8. Give the circuit symbol of AND-gate.



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9. Write any one advantage of light emitting diode.



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10. What is attenuation in communication system ?



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Part B ii Answer Any Five Of The Following Questions

1. State and explain Gauss's theorem in Electrostatics.



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2. Define mobility. Mention its S.I. Unit



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3. What is ohmic device? Give one example.



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4. Write any two differences between diamagnetic and paramagnetic substances.



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5. The magnetic flux linked with a coil varies as

$\phi = 3t^2 + 4t + 9$. Find the magnitude of the

emf induced at $t = 2S$.



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6. Write Maxwell's equation for the speed of electromagnetic waves and explain the terms.



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7. What are de-Broglie Waves ? How does the de-Broglie wavelength vary with momentum of moving particle ?



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8. Draw the block diagram of generalised communication system.



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Part C Iii Answer Any Five Of The Following Questions

1. Derive a relation between electric field and potential



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2. Derive the relation $\vec{j} = \sigma \vec{E}$ with terms which has usual meaning.



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3. How is a galvanometer converted into a voltmeter?



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4. Mention any three application of eddy currents.



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5. Define critical angle. Write two conditions for total internal reflection.



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6. Write any three difference between interference and diffraction.



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7. Define the terms :

Threshold frequency



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8. Explain the use Zener diode as a voltage regulator.



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Part D Iv Answer Any Two Of The Following Questions

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



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



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3. Show that a current carrying solenoid is equivalent to a bar magnet.



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Part D V Answer Any Two Of The Following Questions

1. Derive the lens maker's formula.



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2. 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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3. What is amplification? With a circuit diagram, explain the working of npn transistor as an amplifier in CE configuration.



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Part D Vi Answer Any Three Of The Following Questions

1. In a parallel plate capacitor with air between the plates, each has an area $8 \times 10^{-3} m^2$ and distance between the plates is 2 mm. Calculate the capacitance of the capacitor. If this capacitor is connected to a 50 V supply, what is the charge on each plate of the capacitor? (Absolute permittivity of free space $= 8.85 \times 10^{-12} Fm^{-1}$)



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2. Three resistor 4Ω , 6Ω and 8Ω , are combined in parallel.If the combination is connected to a battery of emf 25 V and negligible Internal resistance, then determine the current through each resistor and total current drawn from the battery.



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3. A sinusoidal voltage of peak value 285 V is applied to a series LCR circuit in which resistor

of resistance 5Ω , pure Inductor of Inductance 28.5 mH and capacitor of capacitance $800 \mu \text{F}$ are connected.

Find the resonant frequency.



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4. In young's double slit experiment distance between the slits is 0.5 mm . When the screen is kept at a distance of 100 cm from the slits, the distance of ninth bright fring from the

centre of the fringe system is 8.835 mm. Find the wavelength of light used.



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5. Calculate the Binding energy and binding energy per nucleon of an oxygen nucleus (O_8^{16}) using the following data (MeV):

Mass of proton = 1.007825 u

Mass of neutron = 1.00865 u

Mass of oxygen nucleus = 15.995 u.



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