PHYSICS

BOOKS - SUNSTAR PHYSICS (KANNADA ENGLISH)

SUPPLEMENTARY EXAM QUESTION PAPER JULY -2015

Part C

1. State Ampere's circuital law . Using it, derive the expression for magnetic field at a point due to a long current carrying conductor .

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2. Define:

(a) Magnetic declination (b)Magnetic dip. Mention the S.I. unit of magnetisation.

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3. Give the expression for energy stored in an inductance coil carrying current.

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4. What is the principle behind the working of a transformer ? Mention any two sources of energy loss in transformer

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5. Explain Young's double slit-experiment.

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6. Writer Bohr's postulates for the hydrogen atom model.

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7. Define input resistance, output resistance and current amplification of a transistor.

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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. 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. Derive th lens maker's formula.

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5. Explain Hallwach's and Lenard's observation on photoelectric effect.

Define :

a.work function

b. Threshold frequency

c. Stopping potential

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6. 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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7. ABCD is a square of side 2m. Charges of $5nC$, $+10nC$ and $-5nC$ are placed at corners A,B and C respectively .What is the workdone in transferring a charge of 5nC from

'D' to the point of intersection of the diagonals ?

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8. Two identical cells either in series or in parallel combination , gives the same current of 0.5 A through external resistance of 4Ω. Find emf and internal resistance of each cell.

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9. A resistor of 100Ω, a pure inductance coil of L=0.5 H and capacitor are in series in a circuit containing an a.c. source of 200 V , 50 Hz . In the circuit , current is ahead of the voltage by 30° . Find the value of the capacitance.

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10. A beam of light consisting of two wave lengths 4200 Å and 5600 Å is used to obtain interference fringes in Young's double slit

experiment. The distance between the slits is 0.3 mm and the distance between the slits and the screen is 1.5 m. Compute the least distance of the point from the central maximum, where the bright fringes due to both the wavelengths coincide.

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11. Calculate the half life and mean life of Radium -226 of activity 1Ci, Given the mass of

Radium - 226 is 1 gram and 226 gram of radium consists of 6.023×10^{23} atoms.

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