



PHYSICS

BOOKS - NN GHOSH PHYSICS (HINGLISH)

DYNAMO, MOTOR, TRANSFORMER

Example

1. The equation of an alternating emf is $\varepsilon = 50 \sin 100\pi t$ Calculate (i) the peak value of

the emf of the emf (ii) the mean value of the emf (iii) rms value of the emf (iv) What Is the interval at which at which it attains maximum value?



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2. A coil of 20Ω resistance and 0.1 henry inductance is connected to 220 V volt 50 cycle mains .What is the impedance of the coil ? What current does it draw Does the current lead or lag and by how much?



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3. Calculate the resistance required to be connected in series with an inductance of 0.2 H in order that the phase difference between the current and the emf may be 45° when the frequency is 50 Hz.



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4. A 40 W -110 V fluorescent tube is to be operated on 220 V -50 Hz AC supply Calculate

the choke required for the purpose.



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5. A step - down transformer is designed to step down the power line voltage of 2200 V, 50 Hz to 220 V for distribution to domestic. Calculate the primary current when the transformer delivers power to a load of only 2.4Ω assuming it to be an ideal one. What is its transformation ratio?



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Exercise

1. The equation of an alternating current is $i = 2 \sin 200\pi t$. Calculate (i) the peak value of the current (ii) the mean value of the current (iii) virtual current.



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2. An electric lamp which runs 100 V d.c and 10-A current is connected to 200 V ,50 cycle AC

mains .Calculatate the inducatance of the choke required.



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3. A 60 V - 10 W electric lamp is to be run on 100 V - 60 Hz mains. Calculate the inductance of the choke coil required. If a resistor is to be used in place of choke coil to achieve the same result, calculate its value.



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4. The impedance of a choke coil is 14Ω and its reactance is 13Ω . What is the resistance of the choke coil?



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5. An alternating emf of 100 V and 50 cycles is applied to a circuit of inductance 0.02 H and resistance 4Ω . Find the peak value of the alternating current.



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6. An AC fluorescent lamp needs 1-A current at 100 V. Calculate the inductance of the choke required to run the lamp on a 50 Hz -220 V supply.



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7. A 60 V -10W lamp is to be run on AC supply of 100 V -50 cycle in series with a suitable capacitor. Find the capacitance of the capacitor that be needed for the purpose.





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8. Show that for a certain value of C , L-C R series circuit is nonreactive and calculate this value of C for the case $l=10$ mH, $R = 100\Omega$ and frequency = 1000 pers.



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