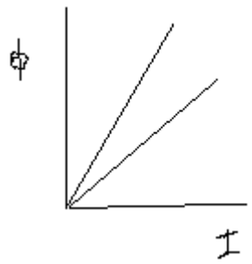
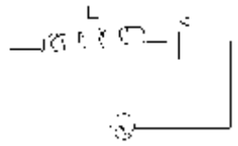
CHOITHRAM SCHOOL MANIKBAGH INDORE

CLASS XII- Session: 2017-18

Subject: Physics **Assignment No: III**

Allotment Date: 01/09/2017 **Submission Date: 08/09/2017**

S.No.	Question	Level	Mark
	OBJECTIVE		
Q.1	A bar magnet falls from a height h through a metallic ring .Will its acceleration be equal to g? Give reason for your answer.	Knowledge	1
Q.2	What is the power consumed in (i)purely inductive (ii)purely capacitive circuit a.c circuit ?	Understanding	1
Q.3	What is the power dissipated in an a.c circuit in which voltage and current are given by $V=230\sin(\omega t-\pi/2)$ and $I=10\sin\omega t$?	Hot	1
	SHORT ANSWER TYPE - I		
Q.4	Derive an expression for instantaneous value of induced emf in a coil when it is rotated in a uniform magnetic field at a uniform angular velocity ω.How does the emf varies when the coil is rotated through an angle 2π ?	Knowledge	2
Q.5	Find rms value of voltage and current $V=230\sin(\omega t-\pi/2)$ and $I=10\sin\omega t$?	Understanding	2
Q.6	A plot of magnetic flux ϕ versus current I is shown in fiure for two inductors A and B .Which one of the two has large value of self inductance ? 	Logical	2
Q.7	Explain series LCR circuit.An inductor L of reactance X_L is connected in series with a bulb B to an a.c source as shown in figure.Briefly explain how does the lightness of the bulb chanes when (i) number of turns of the inductor is reduced and (ii) a capacitor of reactance $X_c = X_L$ is included in series in the same circuit. 	Hot	2
	SHORT ANSWER TYPE - II		
Q.8	The currents flowing in the two coils of self-inductance L_1 = 16 mH and L_2 = 12mH are increasing at the same rate. If the power supplied to the two coils are equal, find the ratio of (i) induced voltages, (ii) the current and (iii) the energies stored in the two coils at a given instant.	Understanding	3
Q.9	Sunita and her friend visited an exhibition.The policeman asked them to pass through a metal detector.Sunita's friend were initially scared of it.Sunita,However,explained to them the purpose and working of the metal detector. (i) on what principle does a metal detector work? (ii) Why does the detector emit sound when a person carrying any metallic object walks through it? (iii) State any two qualities which sunita displayed while explaining the purpose of walking through the detector?	Value based	3
Q.10	What is the principle of transformer,explain its working .A	MultiConceptual	3

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	rectangular coil of N turns and area of cross section A, is held in time varying magnetic field given by $B=B_o\sin\omega t$, with plane of coil normal to the magnetic field . Deduce an expression for the emf in the coil.		
	LONG ANSWER TYPE		
Q.11	What do you mean by power factor of LCR circuit ? Power factor of an a.c circuit is 0.5. What will be the phase difference between voltage and current in the circuit and find the expression for average power consumed in an a.c circuit .	Logical	5
Q.12	(a)Can the voltage drop across capacitor or the inductor be more than the applied voltage? Justify. (b)Calculate the current drawn by the primary coil of a transformer which step down 200 V to 20 V to operate a device of resistance 20 Ω. Assume the efficiency of the transformer to be 80%.	Hot	5