1. (a) For dc, 

For ac, 

⇒ 

∴ 

1. (c) 

⇒ 

Given  so, 

1. (a) Current through the bulb 

*i*

10 *V*

*VL*

*i*

100*V*, 50*Hz*

*L*

60*W*, 10*V*





Also 



1. (c) 

Since  hence 

1. (c) ⇒ 

Also 

1. (a) When a bulb and a capacitor are connected in series to an ac source, then on increasing the frequency the current in the circuit is increased, because the impedance of the circuit is decreased. So the bulb will give more intense light.
2. (d) The instantaneous values of emf and current in inductive circuit are given by and respectively.

So, 





 

Hence, angular frequency of instantaneous power is .

1. (b) 

 and 

1. (b) In *RC* series circuit voltage across the capacitor leads the voltage across the resistance by 
2. (d) The voltage  and  are equal and opposite so voltmeter reading will be zero.

Also 

So 

1. (d) 

and 

1. (d) 





Maximum current 

Hence 

and 5.64 *V*

1. (a) Capacitance of wire



For impedance of the circuit to be minimum  ⇒ 

⇒



1. (c)  



1. (b) 1. *rms* value =

2. 

3. 



1. (c) Given  this is the condition of resonance. So so net voltage across *L* and *C* combination will be zero.

1. (a) At angular frequency *ω*, the current in *RC* circuit is given by

 ......(i)

Also  ......(ii)

From equation (i) and (ii) we get

⇒ 

1. (d) 



*i.e.* 

So average power = 400 *W*

1. (b) 



Now 



1. (b) 





Also

1. (d) At resonance net voltage across *L* and *C* is zero.
2. (c)  

Net current through circuit 



1. (c) 
2. (a) Yes, in *AC* if branch *AB* has *R*, *BC* has a capacitor *C*, and *BD* has a pure inductance *L*

15 *A*

5 *A*

10 *A*

*B*

*A*

*C*

*D*

1. (d) Current will be maximum in the condition of resonance so 

Energy stored in the coil 



 Energy stored in the capacitor





26. (b) At *t* = 0, phase of the voltage is zero, while phase of the current is  i.e., voltage leads by 

1. (a) 
2. (c) 





1. (a) As the current *i* leads the voltage by  it is an *RC* circuit, hence ⇒ 

⇒  as *ω* = 100 *rad/sec*

⇒ .

From all the given options only option (a) is correct.

1. (b) From the graph shown below. It is clear that phase lead of *N* over *M* is . Since time period (*i.e.* taken to complete one cycle) = 0.4 *sec*.

Hence frequency 

*π*/2

*M*

*N*