DS – 1391

I Semester B.Sc. Examination, November/December 2009
(Semester Scheme) (OS)
ELECTRONICS (Paper – I)
Electronic Fundamentals

Time : 3 Hours

Max. Marks : 60

Instruction : *Answer* ***any five*** *questions from Part – **A**,* ***four*** *questions from Part – **B** and any* ***five*** *subdivisions from Part – **C**.*

PART – A

Answer **any five** questions. **(5×6=30)**

1. a) Explain the construction of an electrolytic capacitor.

   b) Define the voltage and current ratio of an ideal transformer. Mention the applications of transformer. **(3+3)**

2. a) Draw the schematic diagram of a CRT and briefly explain its working.

   b) What is an ideal current source ? **(5+1)**

3. Derive an expression for the voltage across a capacitor at any instant of time during charging in a series RC circuit excited by a dc voltage source. Represent it graphically. Define its time constant. **6**

4. Derive an expression for the current, impedance and phase angle of an RL circuit excited by an ac source. **6**

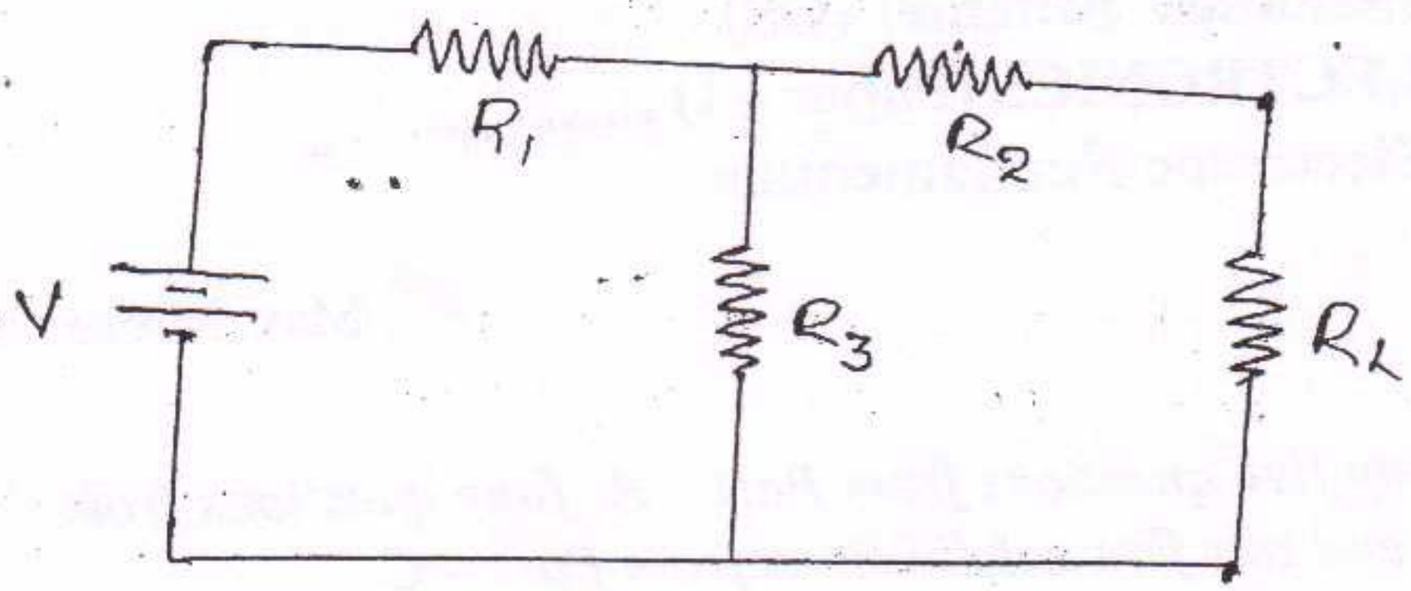
5. a) Define the terms rms value and peak value of an ac voltage.

   b) Derive an expression for the resonant frequency of a series RLC circuit excited by an ac source. Draw the resonant curve. **(2+4)**

6. a) Define the terms linear and bilateral network.

   b) Derive the relations to convert

7. State Thevenin's theorem. Explain the steps involved in Thevenising the given resistive network.



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8. a) Distinguish between n-type and p-type semiconductor.

   b) Explain the behaviour of a Pn junction under forward and reverse bias conditions. Draw its V-I characteristics. (2+4)

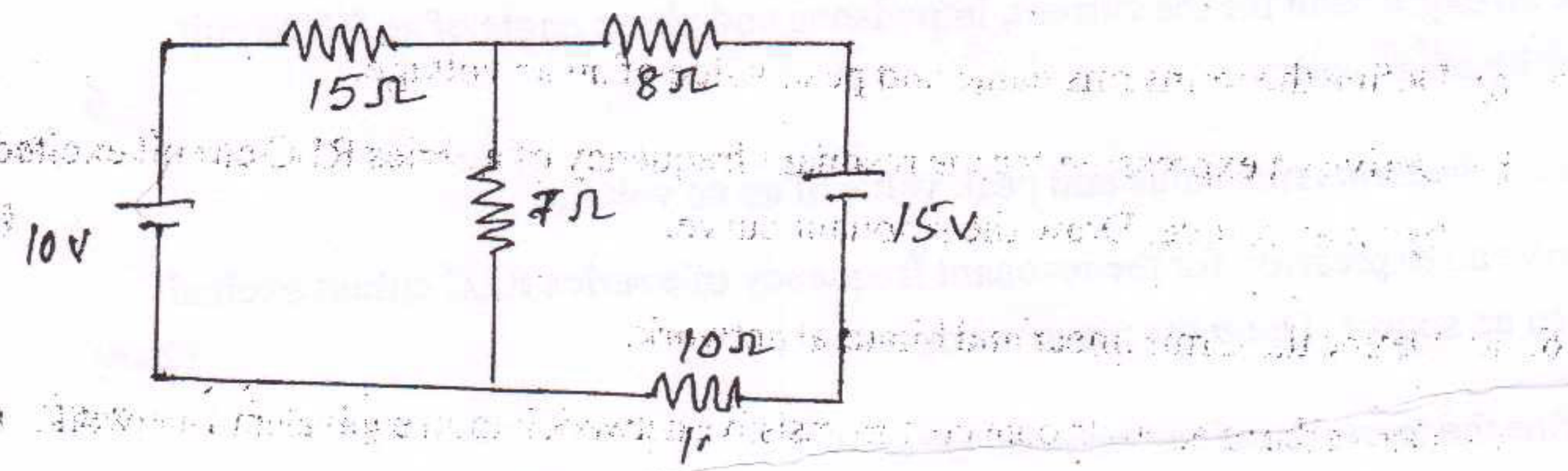
PART – B

Answer **any four** questions : (4×5=20)

9. A galvanometer of resistance 500 Ω gives a full scale deflection of 0.2 mA. Design and draw the circuit of a multirange ammeter for ranges 0-10 mA, 0-100 mA and 0-1A. 5

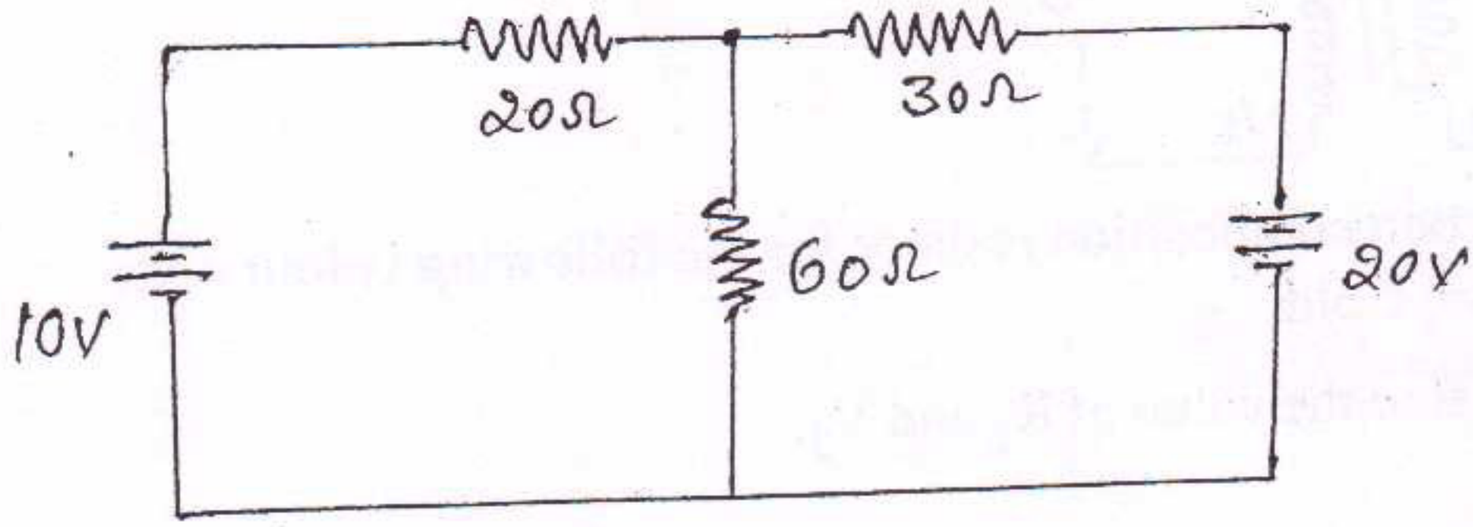
10. A dc source of 100V, resistor of 100 Ω and an inductor of 5H are connected in series. Calculate i) the value of current after 50 ms and ii) time required for the current to grow to 1 A. 5

11. Use mesh current method and find the loop currents in the following circuit. 5



12. A series resonance circuit consists of L = 50 μH, R = 50 Ω and C = 200 PF. Calculate impedance, bandwidth and quality factor. 5

13. Find the current through and voltage across 60 Ω resistor in the circuit given using super position theorem.



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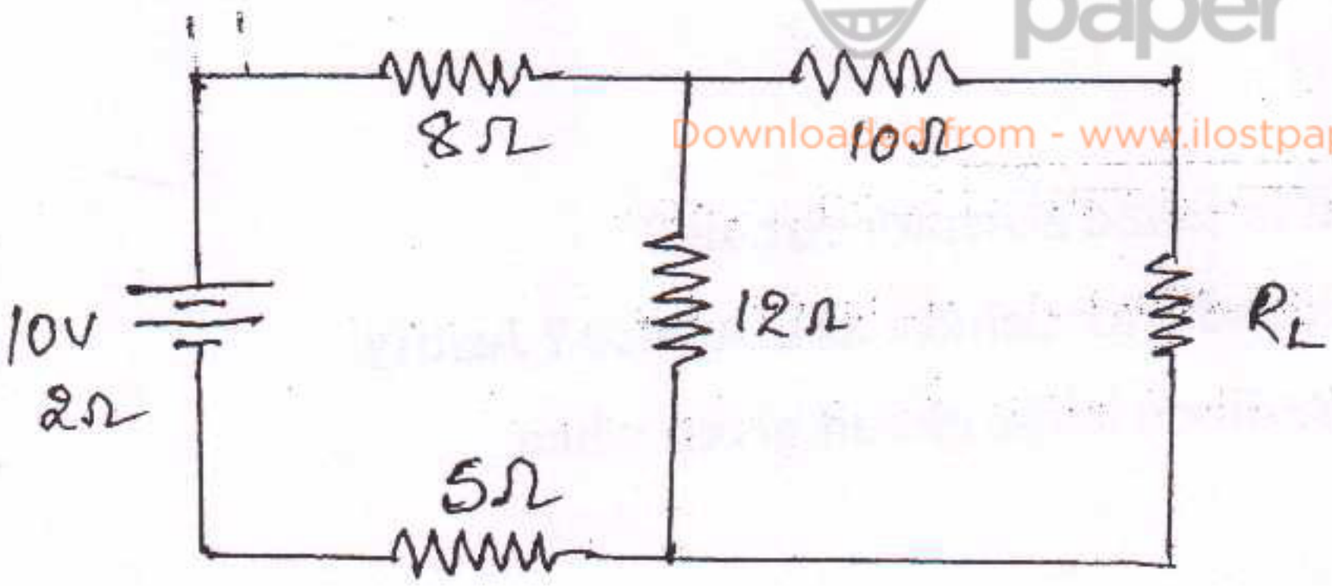
14. Find the value of RL in the circuit given so that is dissipate the maximum power. Also calculate the maximum power delivered to the load.



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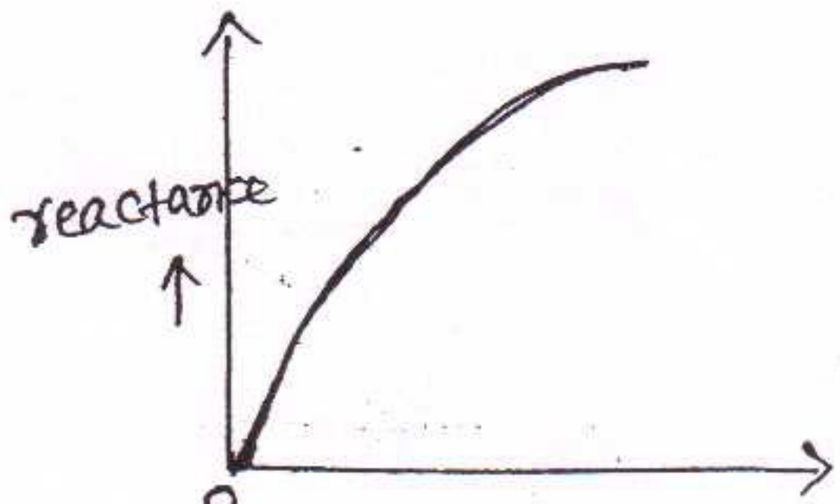
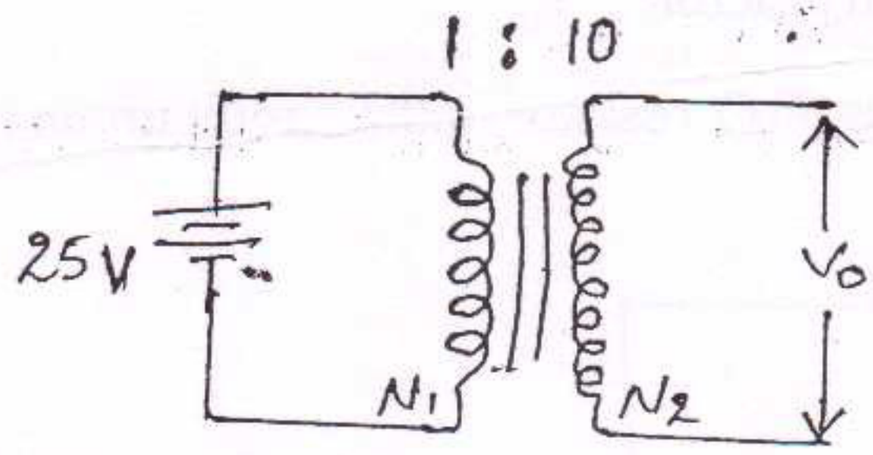
PART – C

Answer **any five** subdivisions. **(5×2=10)**

15. a) The circuit element is sealed. Its reactance varies with frequency as shown. Identify the circuit element. Justify your answer. 2

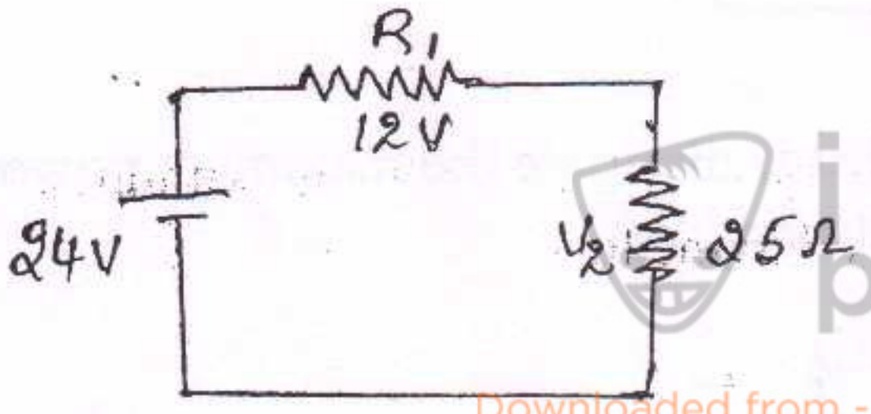


b) What is the output voltage ? Justify. 2



c) Find the value of carbon composition resistor for the following colour code Yellow, Orange, Gold, Gold. 2

d) For the given circuit find the value of R_1 and V_2. 2



e) Why series resonance circuit is called acceptor circuit ? 2

f) When does an intrinsic semiconductor behave as insulator ? Justify. 2

g) What is the voltage across the diode in the circuit given when 2

1) Diode D is Practical

2) Diode D is Ideal ?