



**(Transducers and Network Theorems)**

**Paper - II**

P. Pages : 4

Time : Three Hours

Max. Marks : 50

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- Notes : 1. All questions are compulsory and carry equal marks.  
2. Draw neat and well labelled diagrams wherever necessary.  
3. Use of log table and calculator is allowed.

**1. Either**

- a) What are transducers ? State at least four **2+2**  
general requirements of a transducer. **+6**  
Explain construction and working of a  
moving coil loudspeaker.

**OR**

- b) What is displacement transducer ? **2+6**  
Explain different types of strain gauges. **+2**  
State the significance of gauge factor ?

**2. Either**

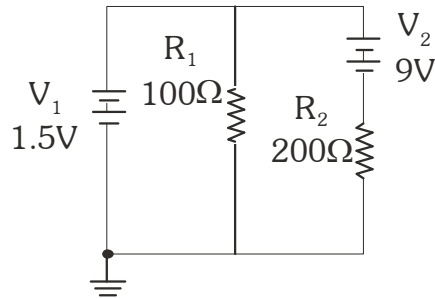
- a) What are the opto-electronic devices ? **2+6**  
Explain the construction and working of **+2**  
photoconductive cell. State the uses of  
photo-conductive cells.

**OR**

- b) Compare LED and LCD. Explain construction and working of field effect type LCD. **3+7**

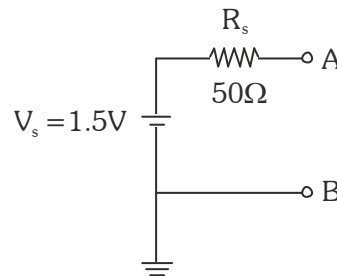
**3.** Either

- a) Explain Kirchhoff's current and voltage law. Using Kirchhoff's laws, find the currents through  $R_1$  and  $R_2$ . **6+4**



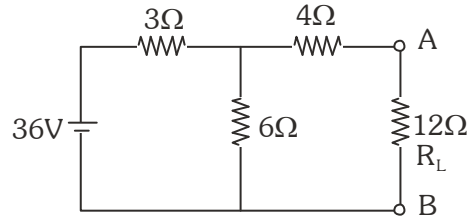
**OR**

- b) How are Ideal current and Ideal voltage sources differ from practical current and voltage sources? Explain with their characteristics. Convert the following voltage source into equivalent current source: **8+2**



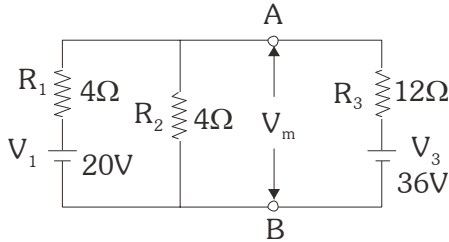
4. Either

- a) State and prove Thevenin theorem. **6+4**  
Calculate the current through  $12\ \Omega$  resistor using Thevenin's theorem.



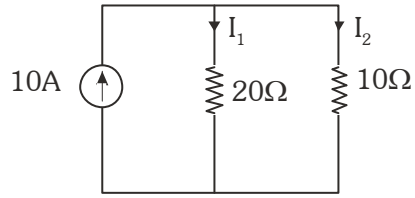
**OR**

- b) State and prove Milliman's theorem. **6+4**  
Using Milliman's theorem, calculate voltage  $V_m$  across points A and B in the network given below:

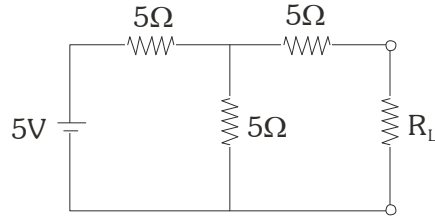


5. a) Explain construction and working of Piezoelectric transducer. **2½**
- b) Explain the working of solar cell. **2½**

- c) Find the currents  $I_1$  and  $I_2$  in the following circuit : **2½**



- d) Find  $R_L$  that extracts maximum power from the given network using maximum power transfer theorem. **2½**



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