2026

SKILL ENHANCEMENT COURSE

Course Name : Basic Workshop Skill in Physics and Electronics

Course Code : PHY-SEC-2013

Full Marks : 30

Time : $1^{1}/_{2}$ Hours

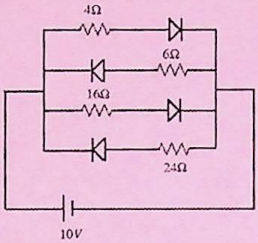
The figures in the margin indicate full marks for the questions.

1. Answer the following questions : 1x5=5
   a) What do you mean by non-ohmic resistor ?
   b) What is NI multisim ?
   c) What is a multimeter ?
   d) What do you mean by power rating of a diode ?
   e) Why do we not use wire wound resistors in high frequency assembly ?

2. Answer the following questions (*any five*) : 2x5=10
   a) Draw the symbols of PNP and NPN transistors.
   b) Draw the circuit of a transistor to use it as a switch.
   c) Differentiate between single layer and multi layer PCB.
   d) What is a data sheet and what are its key components ?
   e) A very high resistance is connected in parallel with a very low resistance. Show that the equivalent resistance is of the order of the low resistance.
   f) A beam of electrons is deflected side ways in passing through a certain region. Is it due to a (i) magnetic (ii) electric field or (iii) both of these. Explain.
   g) Write the difference between the following (any two) :
      (i) Resistance and resistor
      (ii) Capacitance and capacitor
      (iii) Inductance and inductor

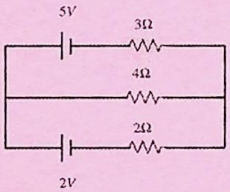
3. Answer the following questions (*any three*) : 5x3=15

a) Calculate the current flowing through the following circuit (assume that connected diodes are ideal)



b) Explain in brief the fabrication technique of a PCB. What are the key components of a breadboard ? 3+2=5

c) Use Kirchoff's laws to find the current in each branch of the following circuit.



d) What is the commonly used PCB material ? Differentiate between a breadboard and PCB. What is circuit simulation ? 1+2+2=5

e) Write short note on (*any two*) : $2^{1}/_{2}$ x 2=5

(i) IC7400 and IC7402

(ii) PCB design software

(iii) 3D printing tools

(iv) Chip fabrication.

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