

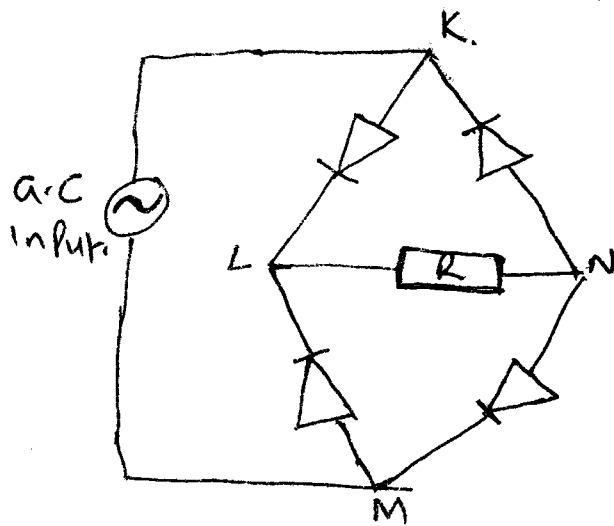
1. a) State one difference between a conductor and a semi-conductor

b) Give one example of a conductor and one example of a semiconductor.

2. State the difference between an intrinsic and extrinsic semiconductor.

3. What is a P-type semiconductor and how is it made?

The diagram below shows a rectifier circuit for an alternating current (AC) input.



(i) what is rectification

(ii) Describe the rectification process

(iii) Sketch a graph to show how the p.d across R varies with time.

5. Extrinsic semiconductors are made through the process known as doping.

(i) Define doping

(ii) How does doping produce an N-type conductor

6. state the difference between donor and acceptor atoms.

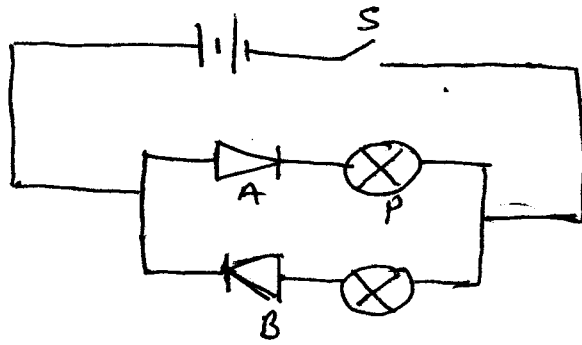
7. A light emitting Diode (LED) is a transducer.  
(i) what is meant by the term transducer?

(ii) What are the two forms of energy in a LED?

8. Draw a diagram using 4 diodes and a capacitor to show how the output voltage can be imposed.

9 a) Distinguish between P-type and N-type semiconductors.

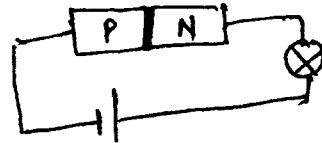
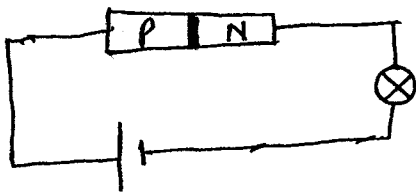
b) The diagram shows an electric circuit with two diodes A and B and a battery.



Explain the observation which would be made if switch  $S$  is closed.

10. Draw a P-N junction diode in forward bias.

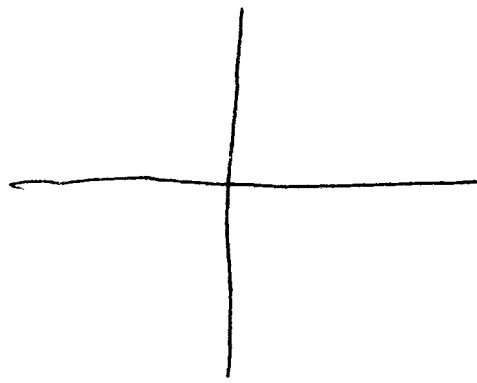
(11) The figure below shows a P-N junction diode connected to an external e.m.f source



State and explain what is observed in the two circuits.

12. The conductivity of a semiconductor increases with an increase in temperature. Explain.

13. On the axes provided below sketch a P-N junction characteristics for both FORWARD and REVERSE bias. Label the axes clearly.



14. The table below shows values of  $V$  and  $I$  recorded during an experiment to investigate diode characteristics

$I(\text{mA})$	0	0	30	100	200	400	600	800
$V$	0	250	500	750	875	975	1075	1100

(i) Plot a graph of current ( $I$ ) against voltage

(ii) In the forward bias, diode does not conduct until a certain minimum voltage ( $V_0$ ) is reached. Explain this effect.

(iii) Determine the slope of the graph and hence find the resistance of the diode at 750V.