

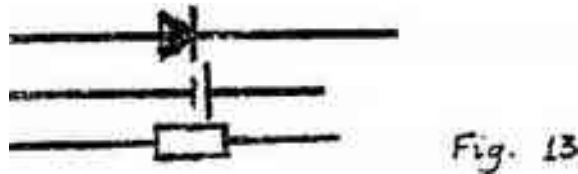
NAME
SCHOOL

INDEX NUMBER
DATE

ELECTRONICS

1. 1997 Q33 P1

Using the components symbols shown in **figure 13**, sketch a series circuit diagram for a forward biased diode.



2. 1997 Q6 P2

- (a) (i) Distinguish between semiconductor and conductors
- | Semiconductors | Conductors |
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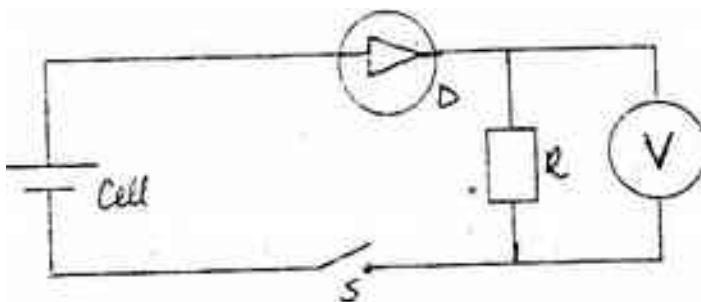
- (ii) Give one example of a semiconductor and one for a conductor

Semiconductors.....

Conductors.....

3. 1998 Q21 P1

In the circuit in **fig 5** when the switch S is closed, the voltmeter shows a reading.



When the cell terminals are reversed and the switch is closed, the voltmeter reading is zero. Explain these observations.

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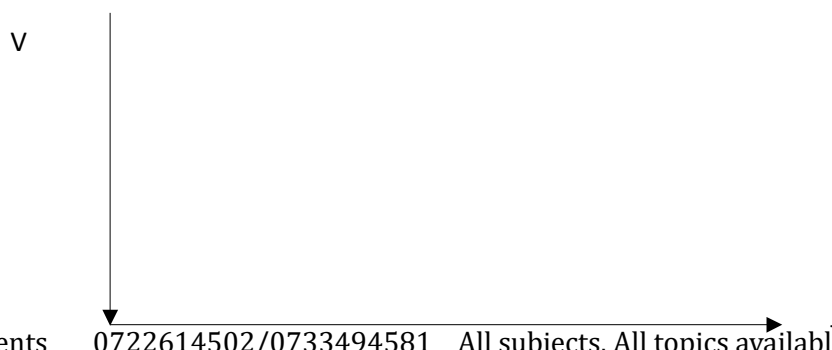
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4. 2001 Q5a,b P2

- a) You are provided with 12V a.c source, four diodes and resistor.
- i) Draw a circuit diagram for a full wave rectifier and show the points at which the output is taken.
 AC source shown-symbols; arrangement of diode (one for each pair); correct position of R; correct position of output.

- ii) Sketch the graph of the output when a capacitor is put in parallel with the resistor in the circuit in (i) above.



b) A certain transistor is connected in common-emitter-mode. The base current I_B is 0.50 ma. Determine the values of the:

(i) Emitter current I_E .

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(ii) Base-collector current gain β

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(iii) Current gain α

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5. 2003 Q19 P1

Pure silicon can be changed into p –type semiconductor by adding an impurity. Explain how this is achieved.

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6. 2005 Q35 P1

Draw appropriate symbols the circuit diagram of a junction diode in reverse bias. (1mark)

7. 2005 Q4 P2

(a) Explain how doping produces an n-type semi-conductor for a pure semi-conductor material. (3 marks)

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b) Fig 5. Shows the circuit of a rectifier using four diodes D_1, D_2, D_3 and D_4 .

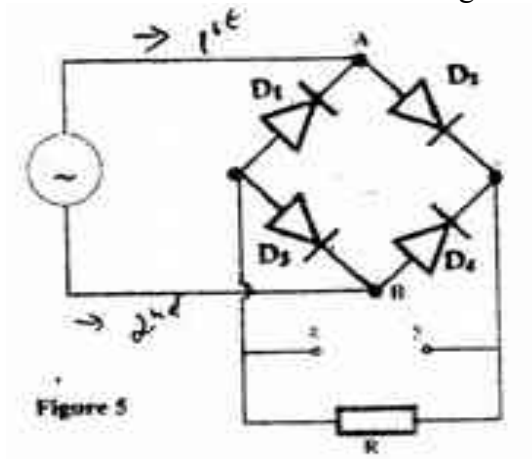


Fig 5.

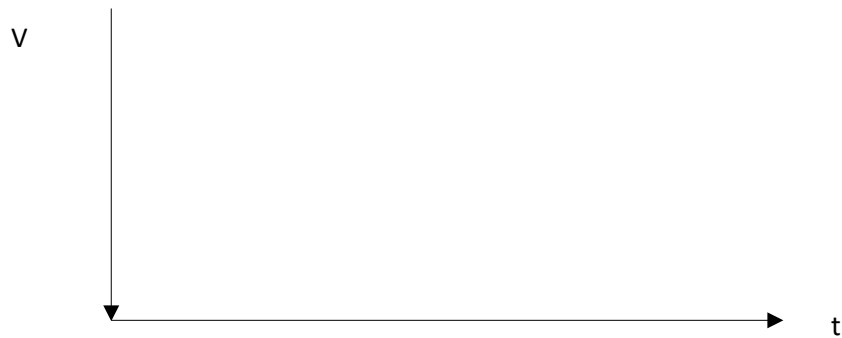
(i) Explain how a rectified output is produced from the set – up when an a.c input is connected across AB (4 marks)

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(ii) On the axis provided sketch the graph of output voltage against time for rectifier (1 mark)



(iii) A capacitor is now connected across XY. Explain the effect of the capacity on the output. (2 marks)

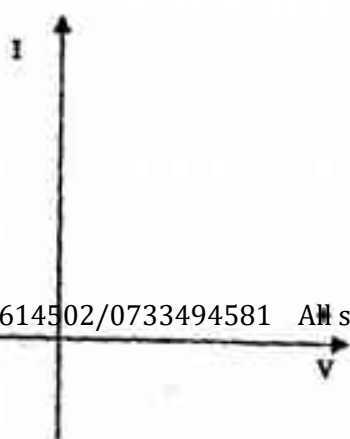
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(c) A transistor in a common – emitter amplifier has $\beta = 120$. A signal in the input causes the base corresponding change in the output voltage if the load resistance is 100Ω . (4 marks)

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8. 2006 Q16 P2

In the axes provided sketch the current – voltage characteristics for reverse – biased p- n junction (1 mark)



9. 2006 Q7 P2

(a) Explain how a p- type semiconductor is made from a pure a Semiconductor

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(b) The curves in fig 10. Show the output characteristics of a n – p-n transistor in common emitter mode. The p.d of the battery, V_{cc} is 9.0V and the load resistors R_L is 1.8 k Ω

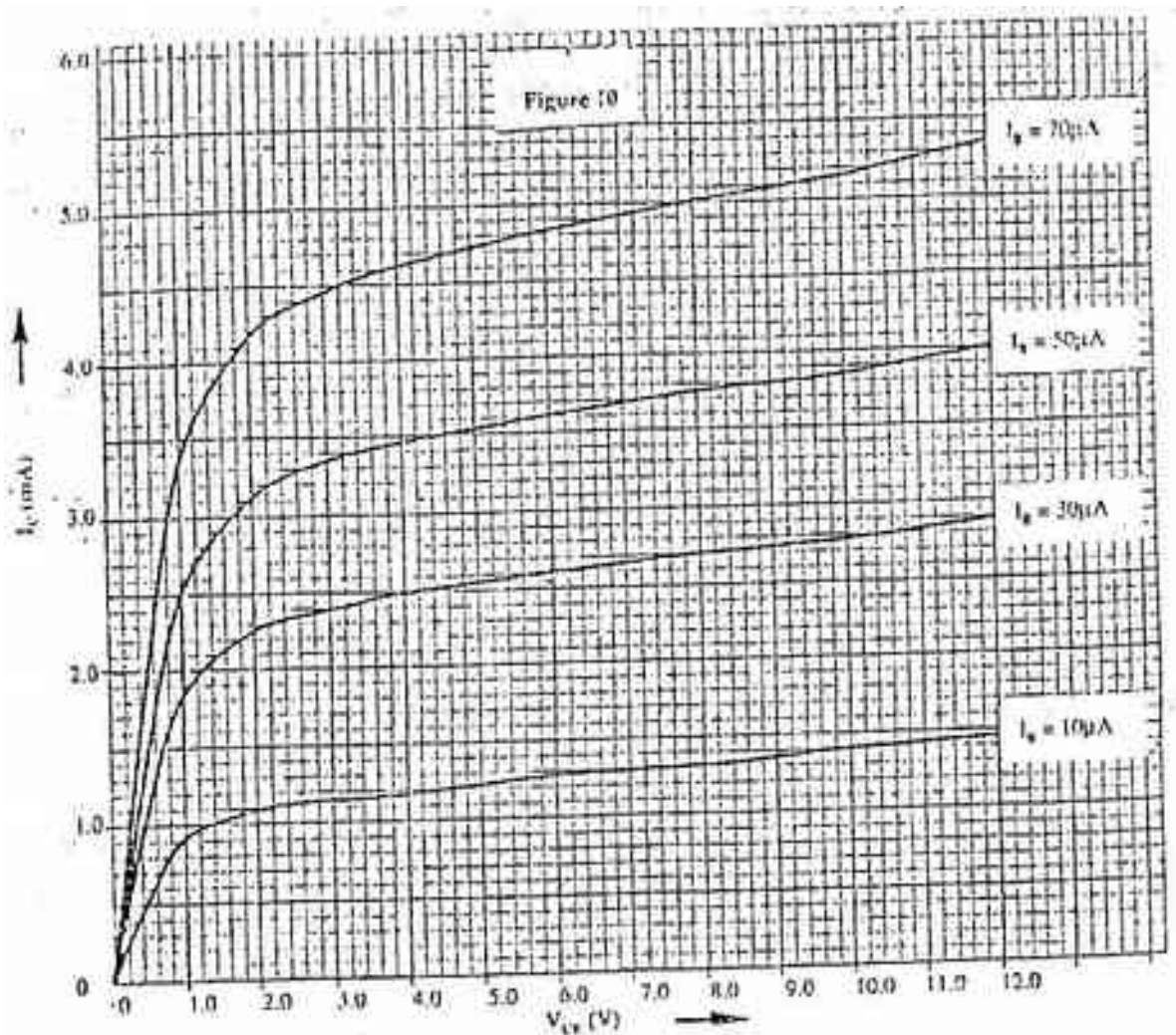


Figure 10

- i. Draw the circuit diagram for the experiment set- up that may be used to obtain the curves in the figure.

- ii. Given that ohm's law for the circuit is $V_{CE} = V_{cc} - I_c R_L$, draw on the same axes, the load line for the circuit (hint: load - line passes through. ($V_{CE} = 0$ and $I_c = 0$)
 Drawing load line on graph (see graph)

When $I_B = 30\mu A$, An alternating signal is fed into the base so that the base current changes by $\pm 20\mu A$. Use the graph to determine the corresponding change in collector current I_c and hence determine the current gain β .

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10. 2007 Q14 P2

You are provided with a diode, a resistor R, an a.c source of low voltage and connecting wires.

In the space provided, sketch the circuit diagram for a half – wave rectifier and indicate the terminals where the output voltage V_0 may be connected. (2marks)

11. 2009 Q13 P2

Figure 6(a) and figure 6(b) shows a p-n junction connected to a battery. It is observed that the current in figure 6(a) is greater than the current in figure 6(b).

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Figure 6(a)

figure 6(b)

State the reason for this observation.

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12. 2010 Q14 P2

Figure 7, shows a block diagram of a p-n junction diode.

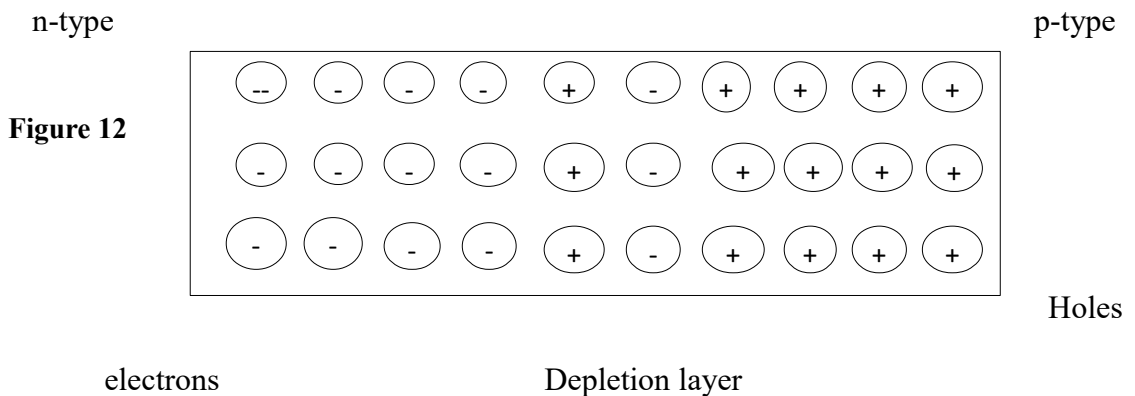
On the same diagram, show how a battery may be connected so that the diode is reverse biased.

13. 2011 Q19c,d P2

(a) State what is meant by an extrinsic semiconductor? (1mark)

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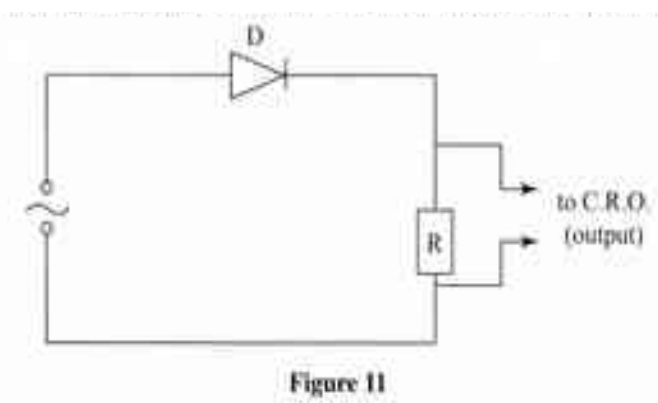
(b) Figure 12, shows a depletion layer in an unbiased p-n junction.



Show how a battery can be used to make the depletion layer narrower. (1mark)

14. 2012 Q13 P2

Figure 11, shows an alternating current (a.c) connected across a diode D and a resistor R.



On the axes provided sketch the output as observed in the C.R.O connected across R. (1mark)

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