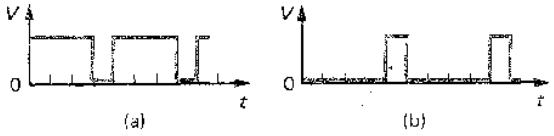
Additional questions

Q1
(a) Draw the circuit symbols for:
(i) a potentiometer, (ii) a capacitor, (iii) a transformer, (iv) a LDR, (v) a loudspeaker, (vi) a microphone, (vii) a diode, (viii) a bipolar transistor, (ix) a LED.
(b) From the list of components in (a), select one having the property stated in each of the following sentences. (i) It rectifies a.c. (ii) Its resistance decreases as the light intensity increases. (iii) It passes a.c. but blocks d.c. (iv) It changes electrical energy to sound. (v) It has three leads called the collector, the base and the emitter.

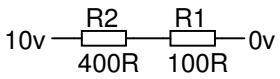
Q2
Under the following conditions would you use TTL or CMOS integrated circuits?
(a) Only a 9 V power supply available.
(b) Large static charges present.
(c) Fast switching essential.
(d) Very low power consumption necessary.

Q3
(a) What is an integrated circuit?
(b) Which digital IC family would you use in designing (i) a wrist watch, (ii) a high-speed computer and (iii) an electronic ignition control system for a boiler?

Q4
What are the duty cycles of the waves below?



Q5
In the circuit below what is
(a) the total resistance,
(b) the current through R_1
(c) the p.d. across R_1,
(d) the power dissipated in R_1,
(e) the chance of *R,* overheating if it is rated at 0.25 W?



Q6
State the units in which the following quantities are measured, choosing from:
watt, ohm, ampere, hertz, volt
(a) current, (b) p.d., (c) resistance, (d) power, (e) frequency.

Q7
Will a 1 k resistor rated at 0.1 w overheat when it is connected across a 20V supply? Explain your answer.

Q8
(a) What will the ammeter A read in Fig. 1?

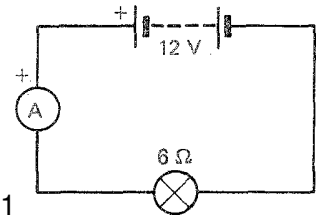


Fig. 1

(b) What is the p.d. (voltage drop) across the lamp of resistance 6R?
(c) Redraw the circuit with a voltmeter V connected to measure the p.d. across the lamp; mark its +terminal.

Q9
Calculate the power of a 4R resistor carrying a current of 2A.

Q10
Calculate the maximum safe current through a resistor of
(a) 100R 1W
(b) 100R 4W
(c) 1.8k 0.5W

Q11
Calculate the power dissipated by a resistor having a pd of 9v across it and carrying a current of 3 mA.