

Energy

- A joule
- B joule per second
- C joule per kilogram per degree Celcius
- D Hertz
- E metre per second

Which of the above is the correct unit for:

1. Specific heat capacity
2. Speed
3. Power
4. Energy
5. Frequency

6. Which list of energy sources contains only non-renewable examples?

- A wind, wave, nuclear
- B hydroelectric, gas, oil
- C coal, oil, geothermal
- D gas, oil, nuclear
- E solar, coal, tidal

7. In a power station, a **boiler** converts water into steam to drive a **turbine**, which in turn operates a **generator** to transfer kinetic energy into electrical energy. The efficiency of these devices are 80%, 50% and 90% respectively. For every 1000 J of chemical energy input to the boiler, the useful energy output of the power station is

- A 360 J
- B 400 J
- C 500 J
- D 800 J
- E 900 J

8. An electric crane does 1500 J of useful work when the energy input is 2000 J. Its efficiency is

- A 25%
- B 50%
- C 75%
- D 33%
- E 100%

9. Which of the following units could be used to measure the rate at which a machine does work?

- A joule
- B newton
- C newton metre
- D watt
- E newton per kilogram

10. 1 kilowatt-hour of electricity is

- A the actual time taken for a kilowatt of energy to be used up
- B the power used by a device which stays on for 1 hour
- C the energy used up in 1 hour by a device whose power is 1 kW
- D the rate of energy supply in one hour
- E the power supplied by 1 unit of charge

11. Electricity costs 6 p per kilowatt-hour. If you run a 3 kW bar fire for five hours, the cost will be

- A 2 p
- B 2.5 p
- C 3.6 p
- D 10 p
- E 90 p

12. Electrical devices with plastic cases often do not have earth connections because

- A they normally use less power and so are quite safe to touch
- B being modern, they contain circuitry which makes earthing unnecessary
- C the plastic would melt if it were connected to earth
- D plastic is a poor conductor so at most only a tiny current would flow if it were touched
- E they are always used on the moon

13. The earth wire to an electric iron should be connected to

- A one end of the element
- B the metal casing
- C the plastic handle
- D the thermostat
- E the neutral wire

14. For which one of the following devices is an alternating current essential for its operation?

- A electromagnet
- B transformer
- C galvanometer
- D lamp
- E bar fire

15. It is desired to use a transformer to step down a mains voltage of 240 V to 12V to power a loudspeaker. Which one of the following responses correctly gives suitable values for the number of primary turns N_p and the number of secondary turns N_s ?

- A $N_p = 800$, $N_s = 40$
- B $N_p = 50$, $N_s = 12$
- C $N_p = 240$, $N_s = 100$
- D $N_p = 500$, $N_s = 50$
- E $N_p = 12$, $N_s = 240$

16. A step down transformer has a turns ratio of 6:1. The frequency of the alternating mains supply is 50 Hz; what will be the frequency of the alternating output?

- A 0.2 Hz
- B 5 Hz
- C 10 Hz
- D 50 Hz
- E 500 Hz