Calculation Practice Answers Paper 1

Any correct rearrangement of the equations is acceptable for the part a) questions
Answers are rounded to a sensible number of significant figures.

1 a) work done = force x distance (along the line of action of the force)
b) 75 J
c) 0.93 m
d) 7.7 N

2 a) kinetic energy = 0.5 x mass x $(\text{speed})^2$
b) 3969 J
c) 4 m/s
d) 288 kg

3 a) gravitational potential energy = mass x gravitational field strength x height
b) 294 J
c) 7.5 m
d) 4.8 kg

4 a) power = energy transferred / time
b) 10 W
c) 120 s
d) 600 J

5 a) 0.6
b) 60 kJ
c) 1500 J

6 a) 11.25 kW
b) 77.8 kW
c) 0.56

7 a) charge flow = current x time
b) 14.4 C
c) 180 s
d) 8.0 A

8 a) potential difference = current x resistance
b) 20 Ω
c) 2.9 A
d) 24 V

9 a) power = potential difference x current
b) 150 W
c) 10.9 A
d) 120 V

10 a) power = current^2 x resistance
b) 400 W
c) 26.4 Ω
d) 5.22 A

11 a) energy transferred = charge flow x potential difference
   b) 1440 J
   c) 87 C
   d) 120 V

12 a) density = mass / volume
   b) 235 kg/m^3
   c) 36 kg
   d) 53 cm^3

13 a) 0.101 J
   b) 3.5 N/m
   c) 30 cm

14 a) 61750 J
   b) 39.7 °C
   c) 476 kg

15 a) 133600 J
   b) 0.442 kg
   c) 555 kJ/kg

16 a) 0.167 m^3
   b) 2020 kPa