- 1
  - a
    - The momentum of the air will increase.
  - b
    - There is a rate of change of momentum so there is a force acting on the air, due to Newton's second law. The air then exerts a force of equal size and opposite direction on the engine, stated by Newton's third law.
  - c
    - In Paper
  - d
    - Momentum is a vector, meaning it has a direction. Due to the air changing direction, the momentum will change.
  - e
    - In Paper
  - f
    - In Paper
  - g
    - rate of intake of air decreases as the plane slows, as there is a smaller rate of change of momentum
- 2
  - a
    - Emitted waves will reflect off of the back wall, and superpose with the incoming waves, causing a stationary wave.
  - b
    - The chocolate only melts in those spots because that is where the antinodes of the microwaves will be, as antinodes are where amplitude is greatest, and thus energy is greatest.
  - c
    - In Paper
  - d

        - So that the positions of the antinodes can continually change during cooking.
- 3
    - a
        - stress/σ : force exerted over cross-sectional area
        - strain/ε : extension over original length
    - b
        - the material is stiff, which is shown on the graph by a steep gradient
    - c
        - In Paper
    - d
        - For a cable in a lift, cable B will be best. This is due to its high breaking stress and young modulus. material A is not a choice because it would fail without warning.
        - For a cable in a bungee cord, cable D would be best. This is due to the fact it can store a large amount of energy before failiure. It could not be any of the other cables as they have a high young modulus, causing a sudden stop to extension, thus higher forces.
- 4
    - a-e
        - In Paper
    - f
        - The resistors have a constant ratio, and thus the potential difference across AB is very small, as the resistance ratios in each arm is very similar.
- 5
    - a
        - The energy of a photon is linked to the frequency, and only when the energy of the photon is greater than the work function are electrons emitted from the plate.
    - b

        - Increasing intensity means more photons incident per second, which will make the current greater.
    - c-d
        - In Paper
    - e
        - The stopping potential would be greater, because the energy of the photons would be greater, thus the maximum kinetic energy would be greater.
- 6
    - a
        - An isotope is an atom with the same proton number but a different nucleon number.
    - b
        - The total momentum of the system must be conserved, and so the two photons must be formed to cancel each-other out.
    - c-e
        - In Paper
- 5-34
    - In Paper