Contents

| ENERGY | Topic 1 | |
|--|---------|--|
| Energy stores and systems | 8 | |
| Changes in energy stores: kinetic energy | 9 | |
| Changes in energy stores: elastic potential energy | 11 | |
| Changes in energy stores: gravitational potential energy | 12 | |
| Energy changes in systems: specific heat capacity | 13 | |
| Power | 14 | |
| Energy transfers in a system | 16 | |
| Efficiency | 17 | |
| National and global energy resources | 18 | |
| | | |
| ELECTRICITY | Topic 2 | |
| Standard circuit diagram symbols | 20 | |
| Electrical charge and current | 21 | |
| Current, resistance and potential difference and resistors | 23 | |
| Series and parallel circuits | 26 | |
| Mains electricity: direct and alternating potential difference (ac/dc) | 28 | |
| Mains electricity | 29 | |
| Electric power (with electrical devices) | 30 | |
| Energy transfers in appliances | 31 | |
| The National Grid | 32 | |
| Static charge and electric fields (1) | 34 | |
| Static charge and electric fields (2) | 35 | |
| PARTICLE MODEL | Tonio 2 | |
| | | |
| Particle model of matter and density of materials | 37 | |
| Changes of state and internal energy | 39 | |
| Changes of temperature and specific latent heat | 40 | |
| Particle motion in gases (1) | 40 | |
| Particle motion in gases (2) | 41 | |
| ATOMS | Topic 4 | |
| The structure of the atom (1) | 42 | |
| The structure of the atom (2) | 43 | |
| Developing a model of the atom | 45 | |
| Radioactive decay and nuclear radiation | 46 | |
| Nuclear equations | 47 | |
| Half-life of radioactive elements | 48 | |
| Hazards and uses of radioactive emissions (1) | 49 | |
| Hazards and uses of radioactive emissions (2) | 50 | |
| Hazards and uses of radioactive emissions (3) | 52 | |
| Nuclear fission and fusion | 53 | |
| | | |
| FORCES | Topic 5 | |
| Forces and their interactions | 54 | |
| Gravity | 55 | |
| Resultant forces | 56 | |
| Work done and energy transfer | 58 | |
| Forces and elasticity | 59 | |
| Moments, levers and gears | 61 | |
| Pressure and pressure differences in a fluid (1) | 62 | |
| Pressure and pressure differences in a fluid (2) | 63 | |
| Distance, displacement, speed and velocity | 65 | |
| Acceleration | 67 | |
| Newton's laws of motion | 69 | |
| Stopping distance | 72 | |
| | | |

| | Momentum (1) |
|-------|--|
| | Momentum (2) |
| | Momentum (3) |
| Topic | 6 WAVES |
| //// | Transverse and longitudinal waves |
| | Properties of waves |
| | Reflection and refraction |
| | Sound waves (1) |
| | Sound waves (2) |
| | Electromagnetic waves (1) |
| | Electromagnetic waves (2) |
| | Lenses |
| | Visible light |
| | Emission and absorption of infrared radiation and black body radiation |
| pic | 7 ELECTROMAGNETISM |
| Z | Magnetism |
| | Electromagnetism |
| | Motor effect |
| | Electromagnetic induction |
| | Transformers |
| ic | 8 SPACE PHYSICS |
| | Our solar system |
| | Life cycle of a star |
| | Orbital motion, natural and artificial satellites |
| | Red-shift |
| | PAPER 1 |
| | |
| | ANSWERS |