



FORM 3

PHYSICS

MARKING SCHEME

| SECTION A | | 40 MARKS | |
|------------------|---|-----------------|---|
| Question | Answer | Marks | Additional Guidelines |
| 1 a. i. | 2.9 cm | 1 | |
| 1 a. ii. | 0.029 m | 1 | |
| 1 b. i. | 55 s | 1 | |
| 1 b. ii. | 11 s | 1 | |
| 1 c. i. | 5 cm ³ | 1 | |
| 1 c. ii. | 2.6 g/cm ³ | 2 | 1 mark for correct unit |
| 1 c. iii. | same | 1 | |
| 2. i. | 550 N | 2 | 1 mark for correct unit |
| 2. ii. | 550 N | 1 | |
| 2. iii. | 11000 J | 2 | 1 mark for correct unit |
| 2. iv. | 275 W | 2 | 1 mark for correct unit |
| 2. v. | To remove sweat, increase friction and grip | 1 | Accept any other suitable answer |
| 3 a. i. | planet | 1 | |
| 3 a. ii. | moon | 1 | |
| 3 a. iii. | solar system | 1 | |
| 3 a. iv. | the Sun | 1 | |
| 3 a. v. | 24 | 1 | |
| 3 a. vi. | Big Bang | 1 | |
| 3 b. i. | distance travelled by light in 1 year | 1 | Accept 9.46×10^{15} m |
| 3 b. ii. | learning more about the universe and its creation / mining minerals on the moon and planets / producing products in zero-gravity environments / expanding scientific research / expanding our environment and saving humanity in case of global destruction | 1 | Accept any other similar answer |
| 4 a. i. | An arrow W from centre of gravity, pointing downwards | 1 | |
| 4 a. ii. | 48000 Pa | 2 | 1 mark for correct total area of blocks |
| 4 a. iii. | Increase area or number of spaced blocks | 2 | Accept also 'decrease weight by removing soil' |
| 4 b. i. | X marked at the base of the dam | 1 | |
| 4 b. ii. | 50000 Pa | 2 | |
| 5 a. i. | 1125 Nm | 1 | |
| 5 a. ii. | 875 Nm | 1 | |
| 5 a. iii. | Anticlockwise moment is not equal to clockwise moment | 1 | Accept other answers which state that the seesaw goes down on John's side |
| 5 a. iv. | 1 m from pivot on Carmen's side | 3 | Give 1 mark to 'on Carmen's side' |
| 5 b. i. | 288 Ncm | 1 | |

| | | | |
|------------------|--|-----------------|--|
| 5 b. ii. | Shorter distance of muscle force from elbow | 1 | Any other suitable answer |
| SECTION B | | 45 MARKS | |
| 6 a. i. | Renewable | 1 | |
| 6 a. ii. | No pollution | 1 | Accept any other suitable answer |
| 6 a. iii. | In case there is no wind and it is night | 2 | |
| 6 a. iv. | 32 W | 2 | |
| 6 a. v. | 32 % | 2 | Accept 0.32 |
| 6 b. i. | Straight line graph | 5 | 1 mark for title 1 mark for correct scale 1 mark for correct axes 1 mark for correct plotting 1 mark for right size of graph (neither too big nor too small) |
| 6 b. ii. | 24 | 2 | |
| 7. i. | Energy is neither created nor destroyed but only changed from one form to another | 2 | |
| 7. ii. | PE – KE – Heat - Sound | 4 | 1 mark each |
| 7. iii. | 48000J | 2 | 1 mark for correct unit |
| 7. iv. | 48000 J | 1 | |
| 7. v. | 3.2 m | 2 | |
| 7. vi. | Work done against friction produces heat | 2 | |
| 7. vii. | Increase mass of hammer or increase height of fall or smaller contact area of base plate | 1,1 | Accept any other correct answer |
| 8 a. i. | cotton wool or polystyrene | 1 | Accept any other suitable answer |
| 8 a. ii. | conduction, convection, radiation | 1,1,1 | |
| 8 a. iii. | conduction | 1 | |
| 8 a. iv. | same initial temperature; no air currents; same volume of water; etc. | 1,1 | Accept any other suitable answer |
| 8 a. v. | reduces heat loss by convection | 1 | |
| 8 a. vi. | | 2 | |
| 8 a. vii | Greater temperature difference resulted in an initial larger rate of heat loss | 2 | 1 mark if there is no reference to rate of heat loss |
| 8 b. i. | 5250 J | 2 | 1 mark for $\Delta\theta = 5^{\circ}\text{C}$ |
| 8 b. ii. | From the foot | 1 | |

Please Note: When marking questions that involve calculations, apply the ‘follow through’ rule. This means that when a student gives a wrong value for part (a) of a question and then uses the value of (a) in the subsequent calculations, marks should be deducted for part (a) only but allocated for the subsequent parts if these are correct.