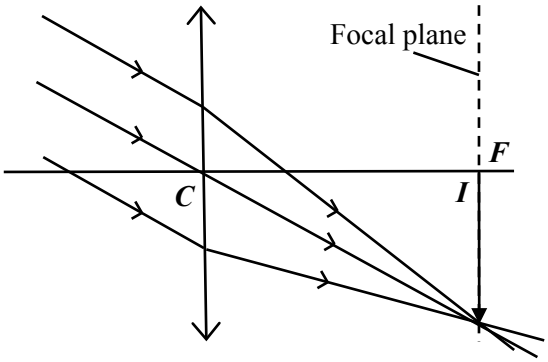
#	Ans	Workings/Remarks
PHYSICS		
1	D	Time taken for 10 swings = T Period of the pendulum = Time taken for 1 swing = T/10
2	A	A heavy steel ball falling from a height of 2 m accelerates to the ground due to gravity at a rate of 10 m/s^2. Since the ball is heavy, it will not reach terminal velocity within the short distance of 2 m and so will fall with at constant acceleration till it hits the ground. In A, gradient of the speed-time graph is constant → constant acceleration. In B, gradient of the speed-time graph is decreasing → decreasing acceleration till terminal velocity. In C, gradient of the distance-time graph is constant → constant speed. In D, gradient of the distance-time graph is decreasing → decreasing speed.
3	C	Unit of Force is Newton. According to Newton's 2nd Law of Motion, an object will accelerate only when the forces acting on an object is unbalanced. Acceleration is the rate of change of velocity.
4	D	$F_X = F_Y$ $2\ m\ (2) = ma$ $a = 4\ m/s^2$
5	C	Inertia is the property of a body that resists a change in its state of rest or motion. The bigger the mass of the object, the more difficult it is to either move it when it is at rest or to stop it when it is moving, and therefore the mass of an object is a measure of its inertia.
6	C	Taking moments about the pivot sum of clockwise moments = sum of anticlockwise moments $2\ (10) + 4\ (20) = U\ (40)$ $U = 2.5\ N$
7	B	$E_k = ½\ mv^2$ $1800 = ½\ m\ (30)^2$ $m = 4\ kg$
8	B	$E_i = E_o$ $E_i = Pt'$ $1.6t = 1.2(18000)$ $t = 13500\ s$
9	A	Dull black surface is the best absorber and emitter of heat radiation while shiny white surface is poor absorber and emitter of heat radiation.

10	C	A: A change of state from liquid (water) to gas (steam), boiling is taking place. Boiling point of water is 100ºC. B: A change in temperature is taking place. C: A change of state from solid (ice) to liquid (water), melting is taking place. Melting point of water is 0ºC. D: A change in temperature is taking place.
11	C	Wavefront is an imaginary line that joins all points that are in phase.
12	C	
13	D	
14	A	Let distance to wall be $d \Rightarrow$ sound travels a distance of $2d$ (to the wall and back) on each clap. In 20 claps, total distance travelled in (10 s) = $20 \times 2d$ m $\therefore 320 = \frac{20 \times 2d}{10} \Rightarrow d = 80$ m
15	B	Conventional current flow from the positive terminal to the negative terminal while electron flow in the opposite direction.
16	B	$R = \frac{kl}{A}$ $8 = \frac{kl}{A}$ $k = \frac{8A}{l}$ $R' = \frac{kl'}{A'}$ $= \frac{\frac{8A}{l}(\frac{l}{2})}{2A}$ $= 2\ \Omega$

17	D	$V_1 = IR$ $= (5 + 2)(1)$ $= 7$ V $V_2 = IR$ $= 5(2)$ $= 10$ V $V = 7 + 10$ $= 17$ V
18	A	$P = IV$ $E/t = IV$ $400000/t = 4(250)$ $t = 400$ s
19	D	The correct position for the fuse and switch in the lighting circuit of a house is on the live (L) wire.
20	C	A larger current in a solenoid will create a stronger magnetic field. With current flowing in the opposite direction, the direction of the magnetic field will be reverse.
CHEMISTRY		
21	D	Boiling point already confirms the purity of water. Anhydrous copper sulfate tests for presence of water.
22	D	Iron (II) hydroxide is the green precipitate. Ammonia gas is given off when aluminium powder is added to test for presence of nitrate ion.
23	B	Isotopes are elements with same proton number but different neutron number.
24	D	Ionic compound has high melting and boiling point because it has strong electrostatic force of attraction. Ionic compound conducts electricity only in liquid state because the ions are mobile.
25	C	
26	A	Mole ratio of alkene : carbon dioxide = 20 : 60 = 1 : 3 This implies each alkene molecule contains 3 carbon atoms.
27	B	The addition of excess aqueous sodium hydroxide causes the temperature to return to room temperature.
28	A	Carbon dioxide is produced and escaped.
29	B	Oxidising agent causes the oxidation state of iodine to increase from -1 in I^-(colourless) to 0 in I_2 (brown).
30	A	$NaOH\ (aq) + HNO_3\ (aq) \rightarrow NaNO_3\ (aq) + H_2O\ (l)$ $\cancel{Na^+}\ OH^- + H^+\ \cancel{NO_3^-} \rightarrow \cancel{Na^+}\ \cancel{NO_3^-} + H_2O$ Ionic equation : $H^+ + OH^- \rightarrow H_2O$
31	C	Pipette and burette are used in titration which uses soluble (aq) reactants to prepare soluble (aq) products.

32	D	
33	C	Fluorine is more reactive than chlorine. As number of shells increases down group VII, the outermost electrons are further away from the nucleus, thus the attraction from nucleus on valence electrons decreases and it is harder to take in electrons down group VII.
34	C	Z is the most reactive metal because it displaces all the other metals from their solutions. X is the least reactive metal because it does not displace any metal from their solution.
35	D	
36	B	Approximately 20% of air is oxygen which reacted with the iron filings to form rust.
37	C	Sulfur dioxide and nitrogen oxide form acid rain which corrodes limestone (carbonates) building.
38	D	As number of carbon atoms varies for the members of the same series, the intermolecular force charges, hence the physical properties change.
39	C	P is saturated because no hydrogen could be added to it.
40	C	