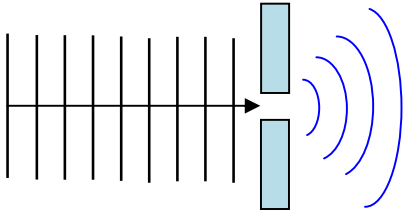
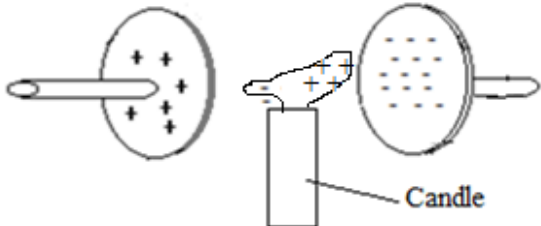
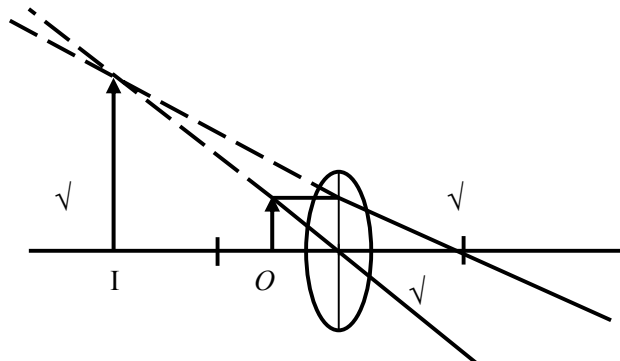


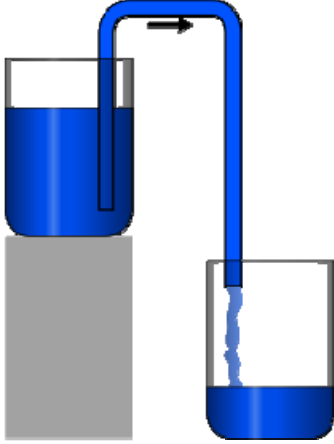
**MARKING SCHEME PAPER 2 SET A
JUJ 2014**

| Number | | | Answer | Marks | |
|--------|---|----|---|--------|-------|
| | | | | Sub | Total |
| 1 | a | | Reflection | 1 | 4 |
| | b | i | Laterally inverted | 1 | |
| | | ii | Upright / virtual / same size as the object / distance between image and mirror same as distance between object and mirror | 1 | |
| | c | | The angle of incidence, $i =$ The angle of reflection, r \surd | 1 | |
| 2 | a | | Unstable nuclei which decays to become stable by emitting radioactive particles | 1 | 5 |
| | b | | Photographic plate / GM-tube / cloud chamber | 1 | |
| | c | | Students have to show the line on the graph Half-life = 8 hours | 1 1 | |
| | d | | $\frac{8}{8} \rightarrow \frac{4}{8} \rightarrow \frac{2}{8} \rightarrow \frac{1}{8}$ $3 T_{\frac{1}{2}} = 3 (8) = 24$ hours | 1 | |
| 3 | a | | Transverse wave | 1 | 6 |
| | b | i | Diffraction | 1 | |
| | | ii |  | 1 1 | |
| | c | i | Less diffraction / less spreading / wave energy increase | 1 | |
| | | ii | More damage to the harbour / soil erosion | 1 | |
| | | | Note : the wavelength must be same as the wave before pass through an entrance | | |

| | | | | | |
|---|-----|--|---|--------|---|
| 4 | (a) | (i) | A region in which there is an electric force // a region around a charged object which gives electric force on another charged object. | 1 | 7 |
| | | (ii) | Increases | 1 | |
| | (b) | (i) | Negative charged | 1 | |
| | | (ii) | Attracted to positive plate // Repelled away from negative plate Note : The flame flatten and spread out more toward negative plate | 1 | |
| | (c) | (i) |  | 1 | |
| | | (ii) | <ol style="list-style-type: none"> The heat of burning candle produces positive and negative ions. The positive ions which are heavier is pulled towards negative plate with a large proportion flame | 1 1 | |
| 5 | a | | Force acting normally per unit area | 1 | 8 |
| | b | i | The depth at point B is higher | 1 | |
| | | ii | The horizontal distance of P is longer | 1 | |
| | | iii | The higher the depth, the longer the horizontal distance | 1 | |
| | | iv | The higher the depth, the higher the pressure | 1 | |
| | c | | Density | 1 | |
| d | | The higher the depth, the higher the pressure, the bigger the force To withstand the huge force acting on the submarine | 1 1 | | |
| 6 | a | | Heat is a form of energy | 1 | 8 |
| | b | i | The mass of substance in Diagram 6.1 < Diagram 6.2 | 1 | |
| | | ii | Time taken to reach the melting point in Diagram 6.1 < Diagram 6.2 | 1 | |

| | | | | | |
|---|---|-----|---|-------------|----|
| | | iii | Time taken by the substance to change into liquid completely in Diagram 6.1 < Diagram 6.2 | 1 | |
| | | iv | The greater the mass the longer the time taken by the substance to change into liquid completely. | 1 | |
| | c | i | Water has a large specific latent heat of vaporization When the steam condenses on the food, the latent heat is released directly into the fish. | 1 1 | |
| | | ii | Killing of Germs and Bacteria / pressure cooker | 1 | |
| 7 | a | | Convex lens | 1 | |
| | b | |  | 1 1 1 | 10 |
| | c | | More than focal length, f | 1 | |
| | d | i | Focal length - Shorter Reason - Power of lens will be high / can be focused at a short distance | 1 1 | |
| | | ii | Diameter – larger Reason – more light enter / image would be brighter | 1 1 | |
| | e | | Camera / slide projector / telescope / microscope | 1 | |
| 8 | a | i | To lower the voltage from 240 V a.c to 6 V a.c | 1 | |
| | | ii | $N_s = \frac{V_s}{V_p} \times N_p$ $= \frac{6}{240} \times 1000$ $= 25$ | 1 1 | 12 |
| | b | | $I = \frac{200000}{100000}$ | 1 | |

| | | | | | |
|---|----|---|---------|--------|--|
| | | | $= 2 A$ | 1 | |
| c | i | Type of transformer - A : Step up transformer B : Step down transformer | | 1 | |
| | | Reason - to increase the voltage before transmission via national grid and lower the voltage before reach to consumers | | 1 | |
| | | ii Diameter of cable - larger Reason - reduce resistance | | 1 1 | |
| | | iii Transmitted voltage - higher Reason - reduce energy loss / lower the current / efficiency of transmission is increased | | 1 1 | |
| | iv | Y | | 1 | |

| | | | | |
|----|-----|------|--|------------------|
| 9. | (a) | | 80 kali | 1 |
| | (b) | i. | $A_1 < A_2$ | 1 |
| | | ii. | $F_1 < F_2$ | 1 |
| | | iii. | Sama// tidak berubah// kekal// tetap | 1 |
| | | iv. | Semakin besar luas permukaan, semakin besar daya terhasil | 1 |
| | | v. | Picagari// lengan robot// brek// lengan jentolak | 1 |
| | (d) | | <ul style="list-style-type: none"> - Menyalurkan/menyedut air - 1) Bikar A diletak di atas bongkah kayu supaya lebih tinggi - 2) masukkan satu hujung tiub getah ke dalam Bikar A - 3) Sedut udara yang ada di dalam tiub getah, dan alirkan air ke Bikar B <p>OR diagram with explanation</p>  | 1 1 1 1 |

| | | | <table border="1"> <thead> <tr> <th><i>Modifikasi</i></th> <th><i>Penerangan</i></th> </tr> </thead> <tbody> <tr> <td>i) Menggunakan minyak sebagai bendalir brek</td> <td>mengelakkan pengaratan// *memindahkan tekanan secara seragam</td> </tr> <tr> <td>ii) Bendalir brek yang berketumpatan/kelikatan tinggi</td> <td>Supaya tidak mudah meruap</td> </tr> <tr> <td>iii) Luas keratan rentas omboh input yang kecil</td> <td>Menghasilkan tekanan yang besar apabila brek ditekan</td> </tr> <tr> <td>iv) Luas keratan rentas omboh output yang besar</td> <td>Menghasilkan daya yang besar pada omboh output</td> </tr> <tr> <td>*Paip penghantaran bendalir dibuat keluli</td> <td>*Tahan tekanan yang tinggi</td> </tr> <tr> <td>*Pengesakan kebocoran minyak brek</td> <td>*Mengelakkan pemandu meneruskan pemanduan</td> </tr> <tr> <td>*Membuang gelembung udara yang terperangkap dalam salur paip penghantaran bendalir</td> <td>*Daya tidak digunakan untuk memampatkan gelembung udara// *tekanan dapat dipindah secara seragam</td> </tr> </tbody> </table> <p>*pilih salah satu pasangan</p> | <i>Modifikasi</i> | <i>Penerangan</i> | i) Menggunakan minyak sebagai bendalir brek | mengelakkan pengaratan// *memindahkan tekanan secara seragam | ii) Bendalir brek yang berketumpatan/kelikatan tinggi | Supaya tidak mudah meruap | iii) Luas keratan rentas omboh input yang kecil | Menghasilkan tekanan yang besar apabila brek ditekan | iv) Luas keratan rentas omboh output yang besar | Menghasilkan daya yang besar pada omboh output | *Paip penghantaran bendalir dibuat keluli | *Tahan tekanan yang tinggi | *Pengesakan kebocoran minyak brek | *Mengelakkan pemandu meneruskan pemanduan | *Membuang gelembung udara yang terperangkap dalam salur paip penghantaran bendalir | *Daya tidak digunakan untuk memampatkan gelembung udara// *tekanan dapat dipindah secara seragam | 10 (max) |
|--|--|-----|---|-------------------|-------------------|---|--|---|---------------------------|---|--|---|--|---|----------------------------|-----------------------------------|---|--|--|----------|
| <i>Modifikasi</i> | <i>Penerangan</i> | | | | | | | | | | | | | | | | | | | |
| i) Menggunakan minyak sebagai bendalir brek | mengelakkan pengaratan// *memindahkan tekanan secara seragam | | | | | | | | | | | | | | | | | | | |
| ii) Bendalir brek yang berketumpatan/kelikatan tinggi | Supaya tidak mudah meruap | | | | | | | | | | | | | | | | | | | |
| iii) Luas keratan rentas omboh input yang kecil | Menghasilkan tekanan yang besar apabila brek ditekan | | | | | | | | | | | | | | | | | | | |
| iv) Luas keratan rentas omboh output yang besar | Menghasilkan daya yang besar pada omboh output | | | | | | | | | | | | | | | | | | | |
| *Paip penghantaran bendalir dibuat keluli | *Tahan tekanan yang tinggi | | | | | | | | | | | | | | | | | | | |
| *Pengesakan kebocoran minyak brek | *Mengelakkan pemandu meneruskan pemanduan | | | | | | | | | | | | | | | | | | | |
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| | | | | 20 | | | | | | | | | | | | | | | | |
| 10. | (a) | | Tindak balas rawak dan spontan bagi nukleus yang tidak stabil untuk menjadi nukleus yang lebih stabil dengan memancarkan zarah/sinar radioaktif. | 1 | | | | | | | | | | | | | | | | |
| | (b) | | - aktiviti awal $10.1 = 10.2$ | 1 | | | | | | | | | | | | | | | | |
| | | | - sela masa menjadi separuh $10.2 > 10.1$ // 10.2 lebih lama//lambat | 1 | | | | | | | | | | | | | | | | |
| | | | - kadar reputan $10.2 > 10.1$ // 10.2 lebih perlahan// 10.2 lebih lama | 1 | | | | | | | | | | | | | | | | |
| | (c) | i. | Semakin cepat kadar pereputan, semakin cepat sela masa menjadi separuh // vice versa | 1 | | | | | | | | | | | | | | | | |
| | | ii. | Semakin cepat separuh hayat, semakin cepat kadar pereputan// vice versa | 1 | | | | | | | | | | | | | | | | |
| | (d) | i. | $U_{92}^{238} \rightarrow Th_{90}^{234}$ | 1 | | | | | | | | | | | | | | | | |
| | | | $U_{92}^{238} \rightarrow Th_{90}^{234} + He_2^4$ | 1 | | | | | | | | | | | | | | | | |
| | | ii. | Nombor nukleon berkurang sebanyak 4 | 1 | | | | | | | | | | | | | | | | |
| | | | Nombor proton berkurang sebanyak 2 | 1 | | | | | | | | | | | | | | | | |

| | (e) | | <table border="1"> <thead> <tr> <th><i>Modifikasi</i></th> <th><i>Penerangan</i></th> </tr> </thead> <tbody> <tr> <td>Menggunakan forsep// tangan robotik</td> <td>Menjarakkan diri daripada sumber radioaktif</td> </tr> <tr> <td>Memakai topeng muka// cermin mata keselamatan</td> <td>Menghalang mata daripada terkena radiasi</td> </tr> <tr> <td>Menyimpan bahan radioaktif di dalam kotak plumbum// konkrit tebal</td> <td>Menahan sinar gamma// mengelak kebocoran radiasi</td> </tr> <tr> <td>Meletak simbol RADIOAKTIF// simbol</td> <td>Memberitahu pengguna tahu tentang kandungan bahan tersebut</td> </tr> <tr> <td>Memakai lencana dedahan radioaktif</td> <td>Mengukur tahap dedahan radiasi</td> </tr> <tr> <td>Memendekkan masa dedahan</td> <td>Mengurangkan tahap//kuantiti dedahan radiasi</td> </tr> </tbody> </table> | <i>Modifikasi</i> | <i>Penerangan</i> | Menggunakan forsep// tangan robotik | Menjarakkan diri daripada sumber radioaktif | Memakai topeng muka// cermin mata keselamatan | Menghalang mata daripada terkena radiasi | Menyimpan bahan radioaktif di dalam kotak plumbum// konkrit tebal | Menahan sinar gamma// mengelak kebocoran radiasi | Meletak simbol RADIOAKTIF// simbol | Memberitahu pengguna tahu tentang kandungan bahan tersebut | Memakai lencana dedahan radioaktif | Mengukur tahap dedahan radiasi | Memendekkan masa dedahan | Mengurangkan tahap//kuantiti dedahan radiasi | 10 (max) |
|---|--|------|--|------------------------|-------------------|-------------------------------------|---|---|--|---|---|--------------------------------------|--|------------------------------------|--|--------------------------|--|-------------|
| <i>Modifikasi</i> | <i>Penerangan</i> | | | | | | | | | | | | | | | | | |
| Menggunakan forsep// tangan robotik | Menjarakkan diri daripada sumber radioaktif | | | | | | | | | | | | | | | | | |
| Memakai topeng muka// cermin mata keselamatan | Menghalang mata daripada terkena radiasi | | | | | | | | | | | | | | | | | |
| Menyimpan bahan radioaktif di dalam kotak plumbum// konkrit tebal | Menahan sinar gamma// mengelak kebocoran radiasi | | | | | | | | | | | | | | | | | |
| Meletak simbol RADIOAKTIF// simbol | Memberitahu pengguna tahu tentang kandungan bahan tersebut | | | | | | | | | | | | | | | | | |
| Memakai lencana dedahan radioaktif | Mengukur tahap dedahan radiasi | | | | | | | | | | | | | | | | | |
| Memendekkan masa dedahan | Mengurangkan tahap//kuantiti dedahan radiasi | | | | | | | | | | | | | | | | | |
| | | | | 20 | | | | | | | | | | | | | | |
| 11. | (a) | | Prinsip Archimedes | 1 | | | | | | | | | | | | | | |
| | (b) | | 1. Total density of ship < density of water 2. Buoyant Force = Total weight of ship (TOLAK : Daya tujah > berat kapal) | 1 1 | | | | | | | | | | | | | | |
| | (c) | (i) | To ensure the ship will not be overload // ensure the safety of ship | 1 | | | | | | | | | | | | | | |
| | | (ii) | Because different water zone has different density of water | 1 | | | | | | | | | | | | | | |
| | (d) | | <table border="1"> <thead> <tr> <th>Characteristics</th> <th>Reasons</th> </tr> </thead> <tbody> <tr> <td>Streamlined shape</td> <td>To reduce water resistance</td> </tr> <tr> <td>Low total mass of ship</td> <td>Reduce inertia effect</td> </tr> <tr> <td>High width of ship base</td> <td>Prevent from overturn // ship more stable // ship not sink deeper</td> </tr> <tr> <td>High volume of air space in the ship</td> <td>Produce greater buoyant force</td> </tr> <tr> <td>Structure <i>Y</i></td> <td>Streamlined shape, low total mass, high width of ship base, high volume of air space in the ship</td> </tr> </tbody> </table> | Characteristics | Reasons | Streamlined shape | To reduce water resistance | Low total mass of ship | Reduce inertia effect | High width of ship base | Prevent from overturn // ship more stable // ship not sink deeper | High volume of air space in the ship | Produce greater buoyant force | Structure <i>Y</i> | Streamlined shape, low total mass, high width of ship base, high volume of air space in the ship | 10 | | |
| Characteristics | Reasons | | | | | | | | | | | | | | | | | |
| Streamlined shape | To reduce water resistance | | | | | | | | | | | | | | | | | |
| Low total mass of ship | Reduce inertia effect | | | | | | | | | | | | | | | | | |
| High width of ship base | Prevent from overturn // ship more stable // ship not sink deeper | | | | | | | | | | | | | | | | | |
| High volume of air space in the ship | Produce greater buoyant force | | | | | | | | | | | | | | | | | |
| Structure <i>Y</i> | Streamlined shape, low total mass, high width of ship base, high volume of air space in the ship | | | | | | | | | | | | | | | | | |
| | (e) | (i) | Volume of water displaced = Volume of wooden block = $\frac{m}{\rho}$ = $\frac{2.5}{550}$ = $4.55 \times 10^{-3} \text{ m}^3$ | 1 1 | | | | | | | | | | | | | | |

