PEPERIKSAAN PERCUBAAN JOHOR SPM 2017

FIZIK KERTAS 1

Skema Jawapan

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | B | **11** | B | **21** | C | **31** | D | **41** | A |
| **2** | D | **12** | C | **22** | C | **32** | B | **42** | D |
| **3** | A | **13** | D | **23** | D | **33** | A | **43** | C |
| **4** | A | **14** | D | **24** | B | **34** | A | **44** | C |
| **5** | B | **15** | D | **25** | D | **35** | B | **45** | C |
| **6** | A | **16** | B | **26** | D | **36** | D | **46** | A |
| **7** | C | **17** | D | **27** | C | **37** | D | **47** | D |
| **8** | C | **18** | C | **28** | C | **38** | A | **48** | C |
| **9** | D | **19** | C | **29** | B | **39** | B | **49** | B |
| **10** | C | **20** | C | **30** | D | **40** | C | **50** | A |

**Fizik**

**4531/2**

**Ogos 2017**

**PEPERIKSAAN PERCUBAAN SPM**

**TAHUN 2017**

===================================================================

**PERATURAN PEMARKAHAN FIZIK**

**Fizik Kertas 2**

**PERATURAN PEMARKAHAN**

Peraturan Pemarkahan ini adalah **SULIT**.

Hanya untuk kegunaan Pemeriksa sahaja.

**Skrip Pemarkahan Ini Mengandungi 15 Halaman Bercetak**

**Skema Pemarkahan Kertas 2**

**Section A / *Bahagian* A**

**Question 1 / *Soalan* 1**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | Potential difference / Voltage  *Beza keupayaan* / *Voltan* | **1** |
| (b)(i) | M1 | Answer with correct unit  *Jawapan dengan unit betul* :  0.8 V | **1** |
| (ii) | M1 | Deduct the reading observed with zero error  // 0.8 V – zero error  *Menolak bacaan dicerap dengan ralat sifar*  // 0.8 V – *ralat sifar* | **1** |
| (c) | M1 | Answer with correct unit:  *Jawapan dengan unit betul* :  0.1 V  [*Reject* : 0.10 V] | **1** |
| **Jumlah markah** | | | **4** |

**Question 2 / *Soalan* 2**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | Phenomenon : Reflection  *Fenomena* : *Pantulan* | **1** |
| (b) | M1 | Characteristics of image :  - Upright / virtual  *Sifat-sifat imej* :  - *Tegak* / *maya*  [Accept any **one** / *Terima mana-mana***satu**] | **1** |
| (c) | M1  M2  M3 | Draw a line from mirror to F  *Melukis satu garis lurus dari cermin ke* F  Draw a line from head of object to C and extrapolate the line to mirror  *Melukis satu garis lurus dari kepala objek ke* C *dan diekstrapolasikan ke cermin*  Draw the image line at the intercept of F and C  *Melukis garis imej pada persilangan garis* F *dan* C  [Ignore the direction of arrow of light]  - *Abaikan arah anak panah cahaya* | **3** |
| **Jumlah markah** | | | **5** |

**Question 3 / *Soalan* 3**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) (i) | M1 | Parallel  *Selari* | **1** |
| (ii) | M1 | Series  *Sesiri* [*Reject* : *Bersiri*] | **1** |
| (b) | M1  M2 | Correct substitution into formula V = IR  *Gantian yang betul ke dalam formula* V = IR  12 = I x 5 // I = 12  5  Answer with correct unit */ Jawapan dengan unit betul* :  I = 2.4 A | **2** |
| (c) | M1 | Increase / Larger / Bigger  *Bertambah* / *Meningkat* / *Lebih besar* | **1** |
| (d) | M1 | Parallel  *Selari* | **1** |
| **Jumlah markah** | | | **6** |

**Question 4 / *Soalan* 4**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | Net force / resultant force is zero  *Daya bersih* / *daya paduan adalah sifar* | **1** |
| (b) | M1 | Tension of the string  *Tegangan tali* | **1** |
| (c) | M1 | 20 N | **1** |
| (d)(i) | M1  M2 | Triangle shape with the correct direction and angle  *Bentuk segitiga dengan arah dan sudut yangbetul*  Length of Y / *Panjang* Y = 10 cm | **2** |
| (d)(ii) | M1  M2 | F = 5.8 x 2 = 11.6 N ± 0.2 N  X = 11.5 x 2 = 23.0 N ± 0.2 N | **2** |
| **Jumlah markah** | | | **7** |

**Question 5 / *Soalan* 5**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | *State the meaning of density correctly* :  *Nyatakan maksud bagi ketumpatan dengan betul:*  Mass per volume // Density =  *Jisim per isipadu* //*Ketumpatan* = | **1** |
| (b) | M1 | Density of air at P is greater than density of air at Q / vice-versa  *Ketumpatan udara di* P *lebih besar berbanding ketumpatan udara di* Q/ *sebaliknya* | **1** |
| (c) | M1 | Altitude of Q / in Diagram 5.1 is higher / altitude of P / in Diagram 5.2 is lower  *Altitud* Q */ Pada Rajah* 5.1 *lebih tinggi* // *Altitud* P / *pada Rajah* 5.2 *lebih rendah* | **1** |
| (d) | M1 | Height of mercury column of P / in Diagram 5.3 is higher // of Q / in Diagram 5.4 is lower  *Ketinggian turus merkuri di* P/ *pada Rajah* 5.3 *lebih tinggi* // *di* Q */ pada Rajah* 5.4 *lebih rendah* | **1** |
| (e)(i) | M1 | When the altitude is higher / increases, the density of air is lower / decreases // Altitude is inversely proportional to density of air  *Apabila altitud bertambah, ketumpatan udara berkurang* // *Altitud berkadar songsang dengan ketumpatan udara* | **1** |
| (ii) | M1 | When the altitude is higher / increases, the atmospheric pressure is lower / decreases // Altitude is inversely proportional to atmospheric pressure  *Apabila altitud bertambah, tekanan atmosfera berkurang* // *Altitud berkadar songsang dengan tekanan atmosfera* | **1** |
| (f) | M1  M2 | Correct substitution into formulaP = ρhg  *Gantian yang betul ke dalam formula* P = ρhg  P = 0.75 x1.36 x104x 10 // 75 x1.36 x104x10  Correct answer /*Jawapan betul* :  = 102000 // 1.02 x105 | **2** |
| **Jumlah markah** | | | **8** |

**Question 6 / *Soalan* 6**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | Potential difference is directly proportional to current//  *Beza keupayaan berkadar langsung dengan arus*  [*Reject* : V is directly proportional to I // V α I] | **1** |
| (b)(i) | M1 | Bulb P and Q in Diagram 6.1 in parallel **and**bulb P and Q Diagram 6.2 in series  *Mentol* P *dan* Q *pada Rajah* 6.1 *adalah selari* ***dan*** *mentol* P *dan* Q *pada Rajah* 6.2 *adalah sesiri*  [*Reject* : mentol P dan Q pada Rajah 6.2 adalah **bersiri**] | **1** |
| (ii) | M1 | Bulb P and Q in Diagram 6.1 are brighter //bulb P and Q Diagram 6.2are dimmer  *Mentol* P *dan* Q *pada Rajah* 6.1 *lebih cerah* // *mentol* P *dan* Q *pada Rajah* 6.2 *lebih malap*/ *kurang cerah* | **1** |
| (iii) | M1 | Potential difference in Diagram 6.1 is bigger //in Diagram 6.2 is smaller  *Beza keupayaan pada Rajah* 6.1*lebih besar*// *pada Rajah* 6.2 *lebih kecil* / *lebih rendah* | **1** |
| (c) (i) | M1 | When bulbs are arranged in parallel, brightness of bulb increased // vice-versa  *Apabila mentol-mentol disambung secara selari, kecerahan mentol bertambah*// *sebaliknya* | **1** |
| (ii) | M1 | When bulbs are in parallel, potential difference is more / equal to potential difference of the battery // vice-versa  *Apabila mentol-mentol disusun secara selari, beza keupayaan adalah lebih besar* / *sama dengan beza keupayaan bateri* | **1** |
| (d) (i) | M1 | Q is brighter than P **and**brightness of P is same with R  Q *lebih cerah berbanding* P**dan** *kecerahan* P *sama dengan* R | **1** |
| (ii) | M1 | Effective resistance of P and R is more than Q // Current is more in bulb Q / vice-versa  *Rintangan berkesan pada* P *dan* R *lebih besar berbanding* Q *// Arus pada* Q *lebih besar / sebaliknya* | **1** |
| **Jumlah markah** | | | **8** |

**Question 7 / *Soalan* 7**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1  M2 | High // *Tinggi*  Bright // *Cerah* / *Terang* | **2** |
| (b) (i) |  | Alarm = 0 0 0 1  *Loceng amaran* = 0 0 0 1  2M – all four output are correct // *keempat-empat output betul*  1M – 3 output are correct // 3 *output betul*  0M – 2 and less output are correct // 2 *dan kurang output betul* | **2** |
| (ii) | M1 | Logic gate DAN  *Get logik* DAN | **1** |
| (c)(i) | M1 | Vs is increases  Vs*semakin meningkat*/ *bertambah* | **1** |
| (ii) | M1  M2  M3 | - When Vs increases, Ic current / base current increases  *Apabila* Vs*bertambah, arus* Ic/ *arus tapak bertambah*  - Transistor is ON  *Transistor dihidupkan*  - Relay switch is ON  suis geganti dihidupkan  [Any **two** are correct / *Mana-mana* **dua***betul*] | **2** |
| (iii) | M1  M2 | Termistor  Switch off the air conditioner automatically when the temperature is too low//  *Mematikan penghawa dingin secara automatik apabila suhu sangat rendah* | **2** |
|  |  | **Jumlah markah** | **10** |

**Question 8 / *Soalan* 8**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a)(i) | M1 | Ratemeter reading increases abruptly // Ratemeter reading is the highest  *Bacaan meter kadar meningkat dengan mendadak*// *bacaan meter kadar paling besar* | **1** |
| (ii) | M1 | Geiger-Muller / GM tube  *Tiub Geiger-Muller* / GM | **1** |
| (b) | M1 | Unstable isotope // Element with unstablenuclei  *Isotop yang tidak stabil* // *unsur dengan nukleus tidak stabil* | **1** |
| (c)(i) | M1  M2 | Half-life / *Separuh hayat* :  - Shorter/ *Singkat*  Reason / *Sebab* :  Water will not be contaminated for a longer period // After short period of time the activity of the radioactive substance will become weak  *Air tidak akan tercemar untuk tempoh masa yang lama* // *Selepas tempoh masa yang singkat aktiviti bahan radioaktif akan menjadi lemah* | **2** |
| (ii) | M1  M2 | Type of radiation / *Jenis sinaran* :  - Gamma / *Gama*  Reason / *Sebab* :  High penetrating power // can penetrate through the soil and detected by detector  *Kuasa penembusan tinggi* // *dapat menembusi tanah dan dikesan oleh pengesan* | **2** |
| (iii) | M1  M2 | State of matter / *Keadaan jirim*:  - Liquid / *cecair*  Reason / *Sebab* :  Dissolved in water easily  *Melarut dalam air dengan mudah* | **2** |
| (d) | M1 | Radioisotope S | **1** |
| (e) | M1  M2 | Shows 3 times of decaying / *Menunjukkan* 3 *kali pereputan*  100% 50% → 25% → 12.5% // 3 x 5.27  Correct answer */ Jawapan betul* :  t = 15.81 years / *tahun* | **2** |
| **Jumlah markah** | | | **12** |

**Section B / *Bahagian* B**

**Question 9 / *Soalan* 9**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** | | |
| (a) | M1 | // | **1** | | |
| (b) | M1  M2  M3  M4  M5 | Object distance / *Jarak objek* :  Object distance of Diagram 9.1 is shortercompared to Diagram 9.2 //vice versa //  *Jarak objek bagi Rajah* 9.1 *lebih pendekberbanding Rajah* 9.2 //*sebaliknya*  Image distance / *Jarak Imej* :  Image distance in Diagram 9.1 is longer compared to Diagram 9.2 // vice versa  *Jarak imej dalam Rajah* 9.1 *lebih jauh berbanding Rajah* 9.2 // *sebaliknya*  Image size */ Saiz imej :*  Image size in Diagram 9.1 is bigger than Diagram9.2/ vice versa *//*  *Saiz imej pada Rajah 9.1 lebih besar berbanding Rajah 9.2* // *sebaliknya*  When image distance increases, the object distance increases / vice-versa //  *Semakin bertambah jarak imej, semakin bertambah jarak objek* /*/sebaliknya*  When object distance increases, the image size decreases // vice-versa  *Semakin bertambah jarak objek, semakin berkurang saiz imej* /*/sebaliknya* | **5** | | |
| (c) | M1  M2  M3  M4 | Object in between F and 2F  *Objek diantara* F *dan* 2F  Light ray parallel to principle axis converge to F after  passing the lens **and** light passing through optical centre does not refract  *Sinar cahaya selari dengan paksi utama mencapah kepada* F *selepas melalui kanta* ***dan*** *arah cahaya melalui pusat optik tidak dibiaskan*  Image formed at the intersection of the two rays //  *Imej yang terbentuk pada persilangan dua arah cahaya*  Image is magnified, inverted and real //  *Imej diperbesarkan, songsang dan nyata* | **4** | | |
| (d) | |  |  |  |  | | --- | --- | --- | --- | | Modification/ *Ubahsuaian* | | Explanation / *Penerangan* | | | M1 | A plane mirror mounted on an adjustable arm  *Cermin satah dipasang pada boleh lengan laras* | M2 | Reflects light to the vertical screen, corrects lateral and vertical inversion  *Memantulkan cahaya kepada skrin menegak, membetulkan songsang sisi dan tegak* | | M3 | Use a converging mirror / concave mirror  *Gunakan cermin menumpu*/ *cermin cekung* | M4 | Focus the light directly to the lens  *Menumpukan lebih banyak cahaya pada kanta*  Increase the intensity of light.  *Meningkatkan keamatan cahaya* | | M5 | Place the halogen lamp at the centre of curvature of the converging mirror  *Letakkan lampu halogen di pusat lengungan cermin menumpu* | M6 | Light from the lamp will reflect back on the same path  *Cahaya dari lampu akan dipantul balik pada laluan yang sama*  Increase intensity of light towards the transparency*Meningkatkan keamatan cahaya ke transparensi* | | M7 | Electric fan operates during and after the lamp is switched on  *Kipas elektrik beroperasi semasa dan selepas lampu dihidupkan* | M8 | To cool down the projector  *Untuk menyejukkan projektor.*  To avoid over heating *Mengelakkan pemanasan terlampau* | | M9 | Use heat filter  *Gunakan penapis haba* | M10 | To absorb excess heat to the transparency *Untuk menyerap habayang berlebihan ke transparensi* | | | **10** | | |
| **Jumlah markah** | | | | **20** |

**Question 10 / *Soalan* 10**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a) | M1 | Number of complete oscillation / vibration per second  *Bilangan ayunan* / *getaran lengkap per saat*  [*Reject* : Frequency = // *Frekuensi* = ] | **1** |
| (b) | M1  M2  M3  M4  M5 | Frequency of the sound waves in Diagram 10.1 higher than Diagram 10.2  *Frekuensi gelombang bunyi dalam Rajah* 10.1 *lebih tinggi berbanding Rajah* 10.2  The distance between the two loud speakers in Diagram 10.1 equal to Diagram 10.2  *Jarak antara dua pembesar suara dalam Rajah* 10.1 *sama dengan Rajah* 10.2  The distance between two consecutive loud sounds in Diagam 10.2 greater than Diagram 10.1  *Jarak antara dua bunyi kuat yang berturutan dalam Rajah* 10.2 *lebih besar berbanding Rajah* 10.1  When the wavelength of the sound waves increases, the distance between two consecutive loud sounds increases  *Semakin bertambah panjang gelombang bunyi, semakin bertambah jarak antara dua bunyi kuat yang berturutan*  Interference  *Interferens* | **5** |
| (c) | M1  M2  M3  M4 | When the waves move to the shore, the depth of sea water decreases.  *Apabila gelombang air merambat ke pantai, kedalaman air berkurang.*  Speed / wavelength of the waves decrease.  *Laju*/ *panjang gelombang air berkurang*  The waves is refracted  *Gelombang air dibiaskan*  The waves is bending towards the normal  *Gelombang air membengkok mendekati garis normal* | **4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (d) | |  |  |  |  | | --- | --- | --- | --- | | Characteristics / *Ciri-ciri* | |  | *Reason / Sebab* | | M1 | Location at bay  *Lokasi di teluk* | M2 | Waves diverge at bay // smaller amplitude of waves // smaller energy of waves  *Gelombang mencapah di*  *teluk*// a*mplitud gelombang lebih kecil* // *tenaga gelombang lebih kecil* | | M3 | Retaining wall made of concrete  *Benteng diperbuat daripada konkrit* | M4 | Not easy to collapse / to crack // can withstand high force of waves impact  *Tidak mudah runtuh / tumbang / retak // menahan daya hentaman ombak yang tinggi* | | M5 | Retaining wall with narrow gaps  *Benteng mempunyai celah kecil* | M6 | More diffraction of waves // amplitude/ energy of wavesdecreases  *Gelombanglebih terbelau* // *amplitud* / *tenaga gelombang*  *berkurang* | | M7 | Higher retaining wall  *Benteng lebih tinggi* | M8 | No over spill ofthe sea waves // to protect the boats from high amplitudes of sea waves  *Air laut tidak melimpah* // *melindungi bot daripada*  *amplitud gelombang laut yang tinggi* | | M9 | Thicker at the bottom of retaining wall  *Benteng lebih tebal di bahagian dasar* | M10 | Can withstand higher  water pressure // the deeper the depth of water, the bigger the water pressure  *Dapat menahan tekanan air*  *yang lebih tinggi*// *semakin bertambah kedalaman air, semakin tinggi tekanan air* | | M11 | The surface of retaining wall is uneven  *Permukaan benteng yang tidak rata* | M12 | To reduce energy of waves  *Mengurangkan tenaga gelombang* |   **Maximum marks / *Markah maksimum* : 10 Markah** | **10** |
|  |  | **Jumlah** | **20** |

**Section C / *Bahagian* C**

**Question 11 / *Soalan* 11**:

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| --- | --- | --- | --- |
| **Soalan** | **Markah** | **Keterangan** | **Jumlah Markah** |
| (a)(i) | M1 | Rate of heat transfer is equal // Net heat transfer is zero  *Kadar pemindahan haba adalah* ***sama***// *Pemindahan haba bersih adalah* ***sifar*** | **1** |
| (ii) | M1  M2  M3  M4 | Liquid X and liquid Y has same initial temperature.  *Cecair* X *dan cecair*Y *mempunyai suhu awal yang sama*.  Liquid X has smaller specific heat capacity compared to liquid Y.  *Cecair* X *mempunyai muatan haba tentu yang lebih kecil berbanding cecair* Y.  Liquid X experience increasing in temperature faster than Y.  *Cecair* X *mengalami kenaikan suhu lebih cepat berbanding cecair* Y.  The rising of temperature of liquid X is higher than that Y.  *Kenaikan suhu cecair* X *lebih tinggi daripada cecair* Y. | **4** |
| (b)(i) | M1  M2  M3  M4 | Correct substitution into formula for quantity of heat in liquid X  *Gantian yang betul ke dalam formula bagi kuantiti haba dalam cecair* X:  Q = mcӨ  = 0.3 x 2100 x (40o-25o) // 0.3 x 2100 x 15o  Correct answer with correct unit :  *Jawapan betul dengan unit betul* :  = 9450 J  Correct substitution into formula for quantity of heat in liquid Y  *Gantian yang betul ke dalam formula bagi kuantiti haba dalam cecair* Y:  Q = mcӨ  = 0.3 x 4200 x (30o – 25o) // 0.3 x 4200 x 5o  Correct answer with correct unit :  *Jawapan betul dengan unit betul* :  = 6300 J |  |
| (ii) | M1 | No heat transfer to surrounding // all heat supplied is absorbed by liquid X and liquid Y  *Tiada haba terbebas ke persekitaran* // *semua haba yang dibekalkan diserap oleh cecair* X *dan cecair* Y | **1** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (a)(i) | M1 | |  |  |  |  | | --- | --- | --- | --- | |  | Characteristics  *Ciri-ciri* |  | Reason  *Sebab* | | M1 | Material of pot is steel  *Bahan periuk ialah keluli* | M2 | Not easy to rust // not easy to oxidise  *Tidak mudah berkarat*// *tidak mudah teroksida* | | M3 | Has release valve  *Mempunyai injap pelepas* | M4 | Release high pressure from the pot  *Membebaskan tekanan gas yang tinggi dari periuk* | | M5 | Has sealing ring  *Mempunyai gegelung pengetat* | M6 | Avoid the leakage of pressure from the pot  *Mengelakkan kebocoran tekanan dari periuk* | | M7 | Pot has many layer  *Periuk mempunyai banyak lapisan* | M8 | Withstand high pressure inside the pot  *Menahan tekanan yang tinggi dalam periuk* | | M9 | Q is chosen  Q *dipilih* | M10 | Because material of pot is steel, has release valve, has sealing ringand pot has many layer  *Kerana bahan periuk ialah keluli, mempunyai injap pelepas, mempunyai gegelung pengetatdan periuk mempunyai banyak lapisan* | | **10** |
|  |  | **Jumlah** | **20** |

**Question 12 / *Soalan* 12**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** |  | **Jawapan** | | **Jumlah Markah** |
| (a) | (i) | M1 : Water from the reservoir flows down through water tunnel  *Air dari takungan menuruni terowong*  M2 : Turbine will rotated  *Turbin akan berputar*  M3 : Magnet in generator will rotated  *Magnet dalam penjana akan diputarkan*  M4 : Coil in generator experienced change in (magnetic) flux  *Gegelung pada penjana mengalami perubahan fluks*(*magnet*)  M5 : Induced e.m.f / voltage will be produced  *D.g.e* / *voltan aruhan dihasilkan*  **Maximum : 4 Marks** | | **4** |
|  | (ii) | M1 : **Gravitational** potential energy to kinetic energy to electrical energy  *Tenaga keupayaan* ***graviti*** *kepada tenaga kinetik kepada tenaga*  *elektrik*  [*Reject* : Potential energy / tenaga keupayaan] | | **1** |
| (b) |  | |  |  |  |  | | --- | --- | --- | --- | |  | Characteristics  *Ciri-ciri* |  | Reason  *Sebab* | | M1 | Type of wire is copper  *Jenis dawai ialah kuprum* | M2 | Small resistance // produce less heat // good electrical conductor  *Rintangan kecil* / *menghasilkan kurang haba* // *konduktor elektrik yang baik* | | M3 | Type of core is soft iron  *Jenis teras ialah besi lembut* | M4 | Easy to magnetized / demagnetized  *Mudah dimagnetkan* / *dinyahmagnetkan* | | M5 | Core is laminated  *Teras besi berlamina* | M6 | Avoid / reduce eddy current  *Elak* / *kurangkan arus pusar* | | M7 | Method of winding the coil is winding the secondary coil on top of the primary coil  *Kaedah lilitan gegelung ialah lilitan gegelung sekunder di atas gegelung primer* | M8 | Avoid / reduce flux leakage  *Elak* / *kurangkan kebocoran fluks* |  | | M9 | R is chosen  R *dipilih* | M10 | Because type of wire is copper, type of core is soft iron, laminated soft iron and the secondary coil is winding on top of the primary coil  *Kerana jenis dawai ialah kuprum, jenis teras ialah besi lembut, teras besi berlaminadan gegelung sekunder dililit di atas gegelung primer* | | | **10** |
|  | (c) | (i) | M1 : Correct substitution into formula :  *Gantian yang betul ke dalam formula* :  Np = Vp  Ns Vs  1000 = 240  Ns 6  M2 : Correct answer / *Jawapan betul* :  Ns = 25 | **2** |
|  |  | (ii) | M1 : Write correct formula :  *Menulis formulayang betul*:  Efficiency = Po x 100%  VsIs  M2 : Write correct substitution into formula :  *Menulis gantian yang betul ke dalam formula* :  80 = Po x 100%  0.2 x 240  M3 : Correct answer with correct unit :  *Jawapan betul dengan unit betul* :  Po = 38.4 W | **3** |
|  |  | **Jumlah** | | **20** |

**END OF MARKING SCRIPT**

***SKEMA PEMARKAHAN TAMAT***

**PEPERIKSAAN PERCUBAAN SPM 2017 JOHOR**

**PERATURAN PEMARKAHAN**

**FIZIK KERTAS 3**

|  |  |  |  |
| --- | --- | --- | --- |
| **1** (a) (i) | Mass of water // m | | 1 |
| (a) (ii) | Increase in temperature // θ | | 1 |
| (a) (iii) | Time of heating // power of heating element // quantity of heat supply, Q | | 1 |
| (b) (i) | θ1 = 28 0C | | 0 |
| (b) (ii) | θ2 = 48 0C, 38 0C, 35 0C, 33 0C, 32 0C  All correct : 2 marks  At least 3 correct : 1 mark | | 2 |
|  | θ = θ2 - θ1  θ = 20, 10, 7, 5, 4  All correct : 2 marks  At least 3 correct : 1 mark | | 2 |
| (b) (i) | |  |  |  |  | | --- | --- | --- | --- | | m/kg | θ2 / 0C | θ = θ2 - θ1 / 0C | 1/ θ , oC-1 | | 0.4 | 48 | 20 | 0.05 | | 0.6 | 38 | 10 | 0.10 | | 0.8 | 35 | 7 | 0.14 | | 1.0 | 33 | 5 | 0.20 | | 1.2 | 32 | 4 | 0.25 | | 1 mark – 4 columns  1 mark – correct units for each columns  1 mark – all values are consistent | | | | | | 3 |
| (c) | **Draw the graph of 1/θ against** m***.***  A - Label y-axis and x-axis correctly√  B -States the unit at the axis correctly√   1. -Both axes with the even and uniform scale √ 2. -5 points correctly plotted: √ √   -at least 3 points correctly plotted √  E -a smooth best straight line√  F -minimum size of the graph is 5 x 4squares of 2 cmx 2cm.√  7 √ - 5 marks  6-5 √ - 4 marks  3-4 √ - 3 marks  2 √ - 2 marks  1 √ - 1 mark | | 5 |
| (d) | 1/ θ is directly proportional m | | 1 |
|  | **Total** | | **16** |
| **2** (a) (i) | decreases | 1 | |
| (ii) | Show an extrapolation line on the graph  Straight line to Y axis at **V = 1.00 V** (with unit) | 1  1 | |
| (iii) | Constant // unchange | 1 | |
| (b) | Electromotive force / e.m.f | 1 | |
| (c) (i) | -Show a triangle (enough size minimum 4 x 4)  -Substitution  0.50 – 1.00 V  0.73 – 0.00 A  r = - 0.685 V A-1 or - 0.685 V/ A or - 0.685 Ω  ( answer with correct unit ) | 1st    2nd  3rd | |
| (ii) | r = - ( - 0.685 )  = 0.685 V A-1 or 0.685 V/ A or 0.685 Ω  ( answer with correct unit ) | 1 | |
| (d) | E = V + Ir  = .0.90 + ( 0.15 x 0.685 ) (V = 0.90 V and r =0.685 A)  = 1.00 V ( answer with correct unit ) | 1st  2nd | |
| (e) | 1.The position of eye position must be perpendicular to scale of ammeter/voltmeter to avoid parallax error.  2. The connection must be tied  3. Switch off the circuit when not taking any reading, so that the connecting wires are not hot | 1 | |
|  | **Total** | **12** | |

|  |  |  |
| --- | --- | --- |
| 3(a) | *Inference:*  The depth of water influence the pressure in liquid. // the pressure in liquid depend on the depth of water | 1 |
| (b) | *Hypothesis:*  The deeper the water level/depth, the higher the pressure in liquid | 1 |
| (c) | *Aims:*  To investigate the relationship between the depth of water and the pressure in liquid.  Variable:  *Manipulated variable*: depth of water, h  *Responding variable*: pressure in water ( the difference in the level of water in the manometer ), *l*  *Fix variable* : Density of water  *Apparatus and materials*:  Thin piece of rubber, rubber tube, thistle funnel, tall plastic bottle, rubber band, retort stand and clamp, **metre rule\*** and manometer and **water\*.**  **\* must state either in procedure or arrangement**  en hashim  **\*\*one end of manometer must open**  Setup up as shown in the labelled diagram or description in the procedure  *Procedure:*  *Controlling the manipulated variables:*   1. The thistle funnel is **immersed** into the water so that its depth, h=**5.0 cm**   *Measuring the responding variables*:   1. The **difference in the levels, *l*** of water in the manometer **is measured (by using the ruler) and recorded**.   *Repeating experiment*:   1. Procedures 2 and 3 are repeated for **h=10.0 cm, 15.0 cm, 20.0 cm and 25.0 cm**   **\*\*\*must state 4 different value exclude value in 1st procedur**   1. The readings are tabulated  |  |  | | --- | --- | | Depth, h / cm | Difference in level, *l* / cm | | 5.0 |  | | 10.0 |  | | 15.0 |  | | 20.0 |  | | 25.0 |  |   Analyzing data  ***l*/cm**  **h/cm**  **Total:** | 1  1  1  1  1  1  1  1  1  1  1  **MAX 12** |

|  |  |  |
| --- | --- | --- |
| 4. (a)  (b)  (c) (i)  (ii)  (iii)  (iv) | **Inference**  The rotation speed of the motor influenced/depend on number of battery/ current flow | 1 |
| **Hypothesis**  If the current increase, then the speed of rotation increase. | 1 |
| **Aim**  To investigate the relationship between the current and distance/speed of the rod | 1 |
| **Variables**   * + 1. **manipulated :**current     2. **responding :** distance of the rod     3. **fixed :**strength of magnet/ mass of the rod | 1  1  1 |
| **List of apparatus and materials**  barmagnet ,iron rod, **power supply\***, ammeter, **meter rule\***  **\* must state either in procedure or arrangement** | 1 |
| **Arrangement of the apparatus**    \*\*All connection must connected | 1 |
| (v) | *Controlling the manipulated variables:*   1. Switch on power supply/close the circuit 2. Adjust current I = 0.5 A by using the rheostat.   *Measuring the responding variables*:   1. Measured the distance of rod movement (by using the ruler).   *Repeating experiment*:   1. Experiment is repeated 4 times with the difference current, I = 1.0 A, 1.2 A, 1.4A and 1.6A.   **\*\*\*must state 4 different value exclude value in 1st procedure** | 1  1  1 |
| (vi) | **Tabulate the data**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Current, I/A** | **0.5** | **1.0** | **1.2** | **1.4** | **1.6** | **1.8** | | **Distance of the rod/cm** |  |  |  |  |  |  | | 1 |
| (vii) | **Analyse the data**  Distance/cm  Current,I/A | 1  **MAX 12** |