

SULIT



BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN MATEMATIK SAINS DAN KOMPUTER

PEPERIKSAAN AKHIR

SESI DISEMBER 2015

PBS 2014: BASIC ENGINEERING SCIENCE 2

TARIKH : 04 APRIL 2016

MASA : 11.15 AM – 1.15 PM (2 JAM)

Kertas ini mengandungi **SEBELAS (11)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT



SECTION A : 100 MARKS
BAHAGIAN A : 100 MARKAH

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **SEMUA** soalan.

QUESTION 1

SOALAN 1

- CLO2 C1 a) Distinguish the different characteristics between **LIQUID** and **GAS** by referring to the following details:

*Kenalpasti ciri perbezaan diantara **BENDALIR** dan **GAS** dengan merujuk kepada perkara berikut :*

- i. Arrangement of particle. [2 marks]

Susunan zarah [2 markah]

- ii. Density. [2 marks]

Ketumpatan [2 markah]

- iii. Compressibility [2 marks]

Mampatan [2 markah]

- CLO2 C2 b) Diagram 1(a) shows a simple hydraulic system used to lift a car with masses 4000 kg. If the radius of the small piston and large piston of the lift is 0.1 m^2 and 0.8 m^2 respectively, calculate :

Rajah 1(a) menunjukkan sebuah sistem hidraulik digunakan untuk mengangkat sebuah kereta yang beratnya 4000 kg. Jika jejari omboh kecil dan besar adalah 0.1 m^2 dan 0.8 m^2 , kirakan :

QUESTION 3
SOALAN 3

- CLO2 C1 a) i. State Ohm's Law
Nyatakan hukum Ohm's [3 marks]
[3 markah]

- ii. State the types of charge and its S.I unit
Nyatakan jenis-jenis dan unit S.I bagi cas [3 marks]
[3 markah]

- CLO2 C2 b) Four resistors, $R_1 = 4.0\Omega$, $R_2 = 6.0\Omega$, $R_3 = 8.0\Omega$ and $R_4 = 12.0\Omega$ are connected in parallel with a 24 V battery.
Empat perintang, $R_1 = 4.0\Omega$, $R_2 = 6.0\Omega$, $R_3 = 8.0\Omega$ dan $R_4 = 12.0\Omega$ disambung secara selari bersama bateri 24V.

- i) Sketch the circuit diagram.
Lakarkan rajah litar [5 marks]
[5 markah]

- ii) Calculate the total resistance in this circuit
Kirakan jumlah rintangan dalam litar ini [5 marks]
[5 markah]

- iii) Find electrical current in resistor $R_1 = 4.0\Omega$, $R_2 = 6.0\Omega$, $R_3 = 8.0\Omega$ and $R_4 = 12.0\Omega$
Cari arus elektrik dalam perintang $R_1 = 4.0\Omega$, $R_2 = 6.0\Omega$, $R_3 = 8.0\Omega$ dan $R_4 = 12.0\Omega$ [5 marks]
[5 markah]

CLO2
C3

- c) Given a 400 m cuprum wire with an area of 0.05 m^2 . Calculate the resistance of the wire. ($\rho_{cuprum}=1.7 \times 10^{-8} \Omega\text{m}$)

Diberi 400 m wayar kuprum dengan luas keratin rentas 0.05 m^2 . Kirakan kerintangan bagi wayar tersebut. ($\rho_{kuprum}=1.7 \times 10^{-8} \Omega\text{m}$)

[4 marks]

[4 markah]

QUESTION 4**SOALAN 4**CLO2
C1

- a) Draw the pattern of magnetic field for the following situations.

Lukiskan corak medan magnet bagi keadaan yang berikut.

- i. Around a bar magnet.

[2 marks]

Di sekeliling magnet bar.

[2 markah]

- ii. Between opposite poles.

[2 marks]

Di antara kutub yang berlawanan.

[2 markah]



- iii. Between like poles.

[2 marks]

Di antara kutub yang sama.

[2 markah]

CLO2
C2

- b) (i) Describe the pattern of magnetic field for a following current-carrying conductor:

Huraikan corak medan magnet bagi pengalir pembawa arus berikut:

- i. Straight wire

[4 marks]

Dawai lurus

[4 markah]



- ii. One circular loop

[4 marks]

Satu gelung bulat

[4 markah]



- (ii) Using a diagram, explain how the right hand grip rule can indicate the polarity of the solenoid.

Dengan bantuan gambarajah, terangkan bagaimana petua genggaman tangan kanan dapat menunjukkan kekutuhan satu solenoid.

[7 marks]

[7 markah]

CLO2
C3

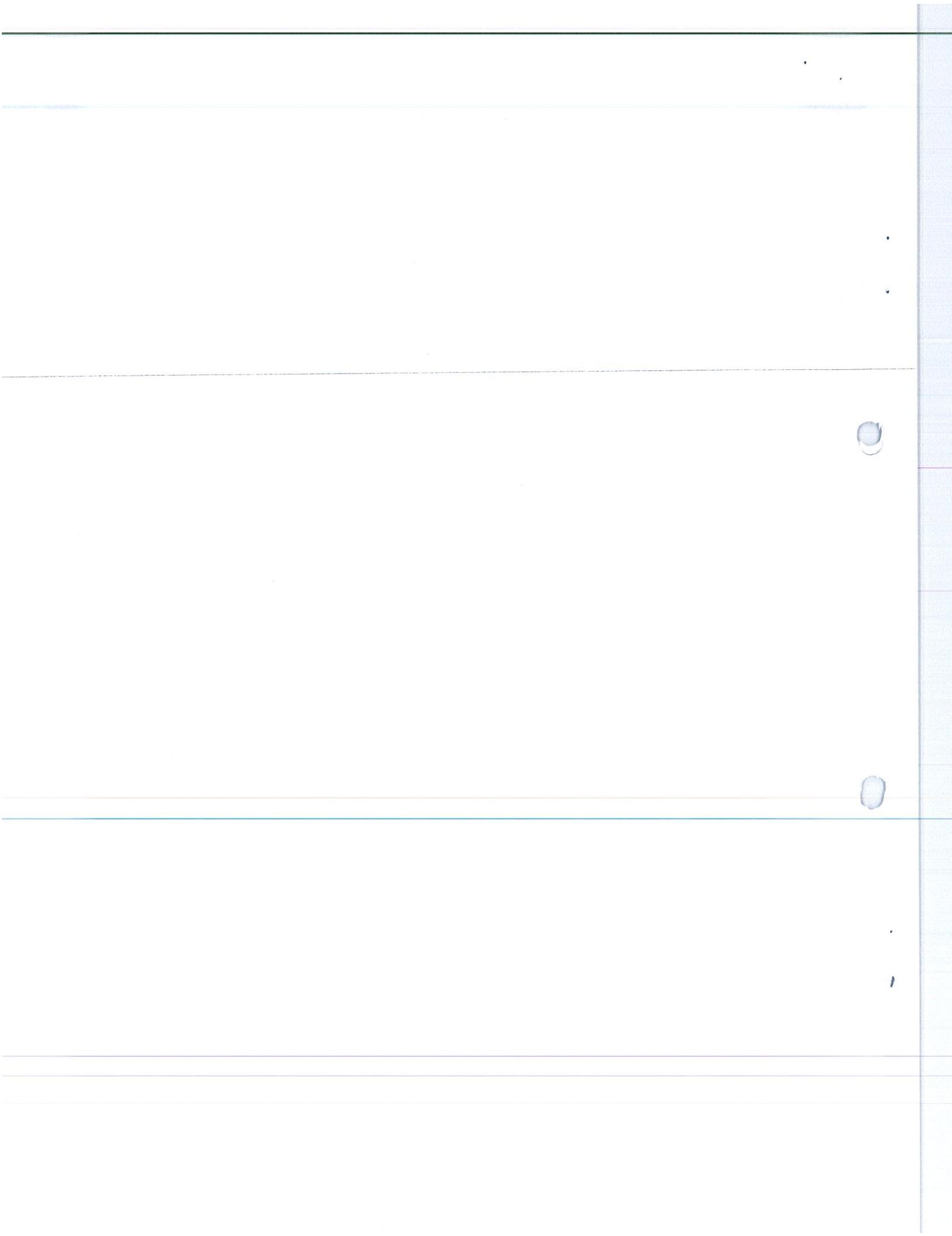
- c) Draw a diagram showing magnetic field lines due to a straight wire carrying current.

Lukiskan gambarajah garis medan magnet yang disebabkan oleh satu dawai lurus yang membawa arus.

[4 marks]

[4 markah]

SOALAN TAMAT



FORMULA PBS 2014
BASIC ENGINEERING SCIENCE 2

$$1. \quad g = 9.81 \frac{m}{s^2}$$

$$2. \quad \rho_{water} = 1000 \text{ kg/m}^3$$

$$3. \quad \rho = \frac{m}{v}$$

$$4. \quad \rho_{relative} = \frac{\rho_{substance}}{\rho_{water}}$$

$$5. \quad P = \frac{F}{A}$$

$$6. \quad P = \rho gh$$

$$7. \quad \text{Pascal's Principle}, \frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$8. \quad F_B = \rho V g$$

$$9. \quad Q = mc\Delta\theta$$

$$10. \quad I = \frac{Q}{t}$$

$$11. \quad Q = ne$$

$$12. \quad V = \frac{W}{Q}$$

$$13. \quad V = \frac{E}{Q}$$

$$14. \quad V = \frac{P}{I}$$

$$15. \quad V = IR$$

$$16. \quad R = \frac{\rho L}{A}$$

17. For Series Circuit,

$$I = I_1 = I_2 = I_3$$

$$V = V_1 + V_2 + V_3$$

$$R = R_1 + R_2 + R_3$$

18. For Parallel Circuit,

$$V = V_1 = V_2 = V_3$$

$$I = I_1 + I_2 + I_3$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

