

INSTRUCTION:

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

ARAHAN:

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

QUESTION 1**SOALAN 1**

CLO1
C1

(a) State the **symbol** and **unit** of all electrical quantities below:

*Nyatakan **simbol** dan **unit** bagi semua kuantiti-kuantiti elektrik di bawah:*

i. Resistance

Rintangan

ii. Power

Kuasa

iii. Energy

Tenaga

[6 marks]
[6 markah]

CLO1
C2

(b) Resistances of 2Ω , 4Ω , and 6Ω that are connected in parallel across a power supply having a voltage of 200 V. Determine:

Perintang-perintang 2Ω , 4Ω and 6Ω disambungkan secara selari dengan bekalan kuasa 200 V. Tentukan:

i. The total circuit resistance

Jumlah rintangan litar

[4 marks]
[4 markah]

- ii. The current flow through a $4\ \Omega$ resistor.

Nilai arus yang mengalir di dalam perintang $4\ \Omega$.

[3 marks]

[3 markah]

CLO1
C3

- c) Determine, using Kirchoff's laws, each branch current for the network shown in Diagram 1(c).

Tentukan dengan menggunakan kaedah Hukum Kirchoff's, arus setiap cabang rangkaian yang ditunjukkan di Rajah 1(c).

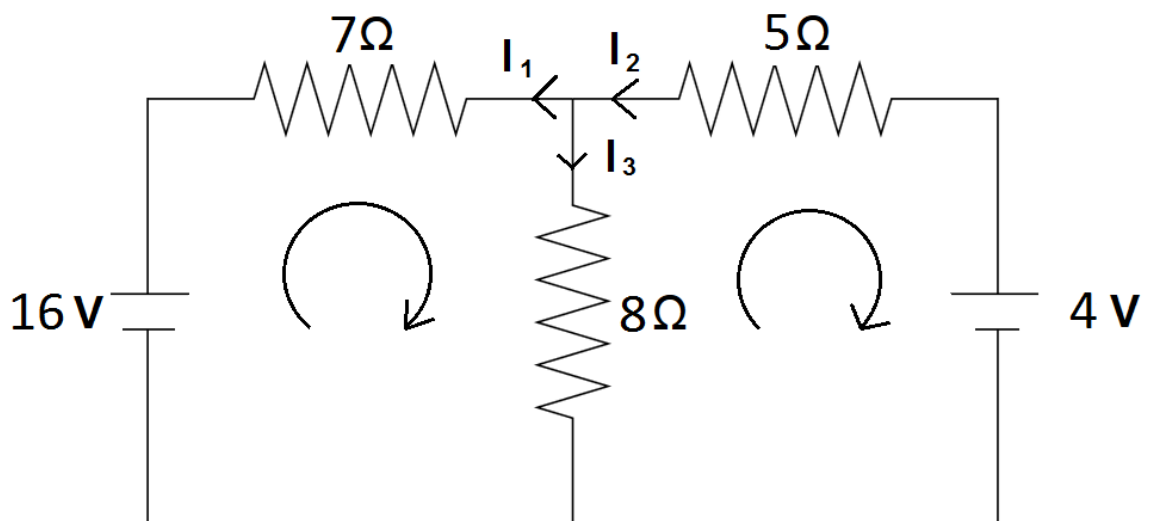


Diagram 1 (c) / Rajah 1 (c)

[12 marks]

[12 markah]

QUESTION 2

SOALAN 2

CLO1
C1

- (a) Capacitor is one of electrical components.

Pemuat adalah salah satu komponen elektrik.

- i. State the structure of capacitor

Nyatakan struktur pemuat

[3 marks]

[3 markah]

- ii. Draw the diagram of fixed and variable capacitors.

Lukis gambarajah pemuat tetap dan pemuat berubah.

[2 marks]

[2 markah]

CLO1
C2

- (b) Three capacitors are connected across a 30 V supply in Diagram 2 (b). Calculate:

Tiga pemuat disambungkan dengan bekalan 30 V di dalam Rajah 2 (b). Kirakan:

- i. total capacitance

jumlah kemuatan

[4 marks]

[4 markah]

- ii. the charge on each capacitor.

cas pada setiap pemuat.

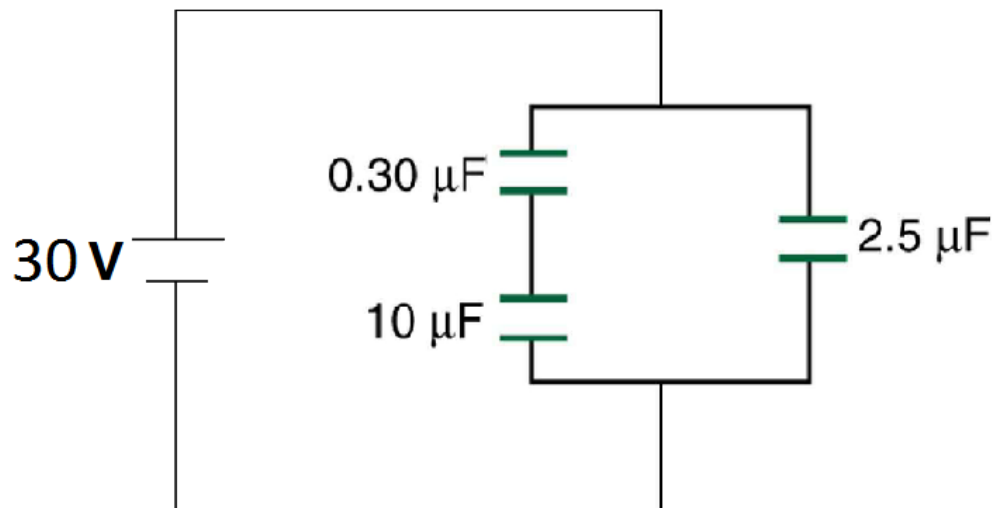


Diagram 2 (b) / Rajah 2 (b)

[6 marks]

[6 markah]

CLO1
C3

(c) A coil of inductance 360mH and resistance 0.9kΩ are connected in series with a 17 μF capacitor and is supplied at 100 V at a frequency of 60Hz. Determine:
Gegelung pengaruh 360 H dan perintang 0.9kΩ disambungkan secara sesiri dengan pemuat 17 μF dan dibekal 100 V voltan pada frekuensi 60Hz. Tentukan:

- i. The impedance value
Nilai galangan

[7 marks]
 [7 markah]

- ii. The current in the coil.
Arus di dalam gegelung.

[3 marks]
 [3 markah]

QUESTION 3

SOALAN 3

CLO1
C1

- (a) Explain the direction of the magnetic field produced by the current I in the solenoid by using Screw Rule and Grip Rule method.

Terangkan arah medan magnet yang dihasilkan oleh arus I di dalam solenoid menggunakan kaedah "Screw Rule" dan "Grip Rule".

[6 marks]
 [6 markah]

CLO1
C2

- (b) A coil of 800 turns is wound uniformly on a ring of non-magnetic material. The ring has a mean circumference of 14 cm and a uniform cross-sectional area of 4 cm². If the current in the coil is 2A, calculate:

Gegelung 800 pusingan dililit secara sekata pada cincin bahan bukan magnet. Cincin itu mempunyai ukur lilit 14 cm dan luas keratan rentas 4 cm². Jika arus di dalam gegelung ialah 2A, kira:

- i) The magnetomotive force
Daya gerak magnet

- ii) The magnetic field strength
Kekuatan medan magnet
- iii) The flux density
Ketumpatan fluks
- iv) The total magnetic flux in the ring.
Jumlah fluks magnet di dalam cincin.

[10 marks]
[10 markah]

CLO1
C3

- (c) A mild steel closed magnetic circuit has a mean length of 65 mm and cross-sectional area of 240 mm^2 . A current of 6 A flows in a coil that is wound uniformly around the circuit and the flux produced is $300 \mu\text{Wb}$. If the relative permeability of the steel at this value of current is 500, determine:

Sebuah litar magnet tertutup mempunyai panjang min 65 mm dan luas keratan rentas 240 mm^2 . Arus 6 A mengalir di dalam gegelung mengelilingi litar secara seragam dan menghasilkan fluks $300 \mu\text{Wb}$. Jika ketelapan bandingan besi ialah 500, tentukan:

- i) The absolute permeability
Ketelapan tentu
- ii) The reluctance of the material
Engganahan bahan
- iii) The number of turns of the coil
Bilangan pusingan gegelung

[9 marks]
[9 markah]

QUESTION 4**SOALAN 4**CLO1
C1

- (a) Briefly describe the principle of operation of a transformer.

Terangkan secara ringkas prinsip operasi sebuah pengubah.

[6 marks]
[6 markah]

CLO1
C2

- (b) An ideal transformer has a turns ratio of 8:1 and the primary current is 6 A when it is supplied at 120 V. Calculate the secondary voltage, current and power.

Sebuah pengubah ideal mempunyai nisbah pusingan 8:1 dan arus primer 6 A apabila disambungkan dengan bekalan 120 V. Kirakan voltan, arus dan kuasa sekunder.

[9 marks]
[9 markah]

CLO1
C3

- (c) An ideal transformer, that is connected to a 160 V mains, supplies a 12 V voltage to a 150 W lamp.

Sebuah pengubah disambungkan kepada bekalan utama 160 V boleh membekalkan 12 V voltan kepada lampu 150 W.

- i) Calculate the secondary current, the transformer turns ratio and the current taken from the supply.

Kirakan arus sekunder, nisbah pusingan pengubah dan arus yang diambil dari bekalan.

- ii) Determine the type of transformer based on the information given.

Tentukan jenis pengubah ini berdasarkan maklumat yang diberi.

[10 marks]
[10 markah]

SOALAN TAMAT