



Jawapan

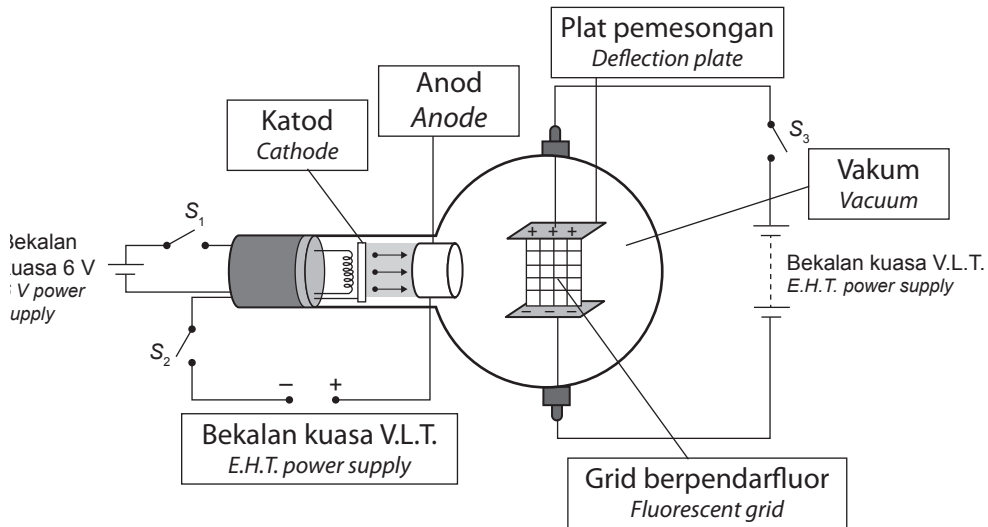
Bab 5

BAB 5

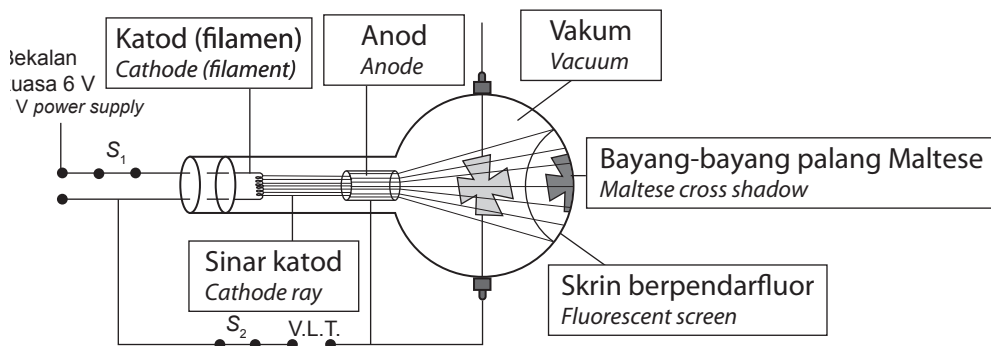
Elektronik Electronics

5.1 Elektron Electron

1.



2.



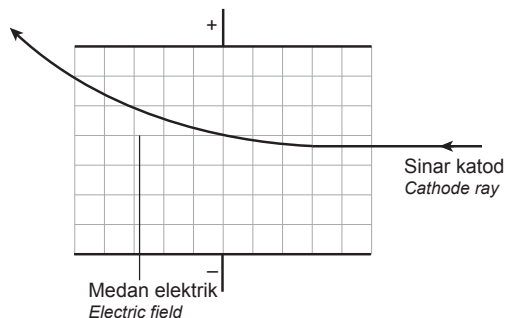
3. (a) elektron bebas, permukaan logam / free electrons, metal surface
(b) kelajuan tinggi, tiub vakum / high speed, vacuum tube

4.

(a)	Sinar katod bercah negatif. Cathode ray is negatively charged.	✓
(b)	Sinar katod bergerak dalam garisan lurus. Cathode ray travels in a straight line.	✓
(c)	Sinar katod tidak boleh dipesongkan di dalam medan magnet. Cathode ray cannot be deflected in a magnetic field.	

(d)	Sinar katod boleh dipesongkan di dalam medan elektrik. <i>Cathod ray can be deflected in an electric field.</i>	✓
(e)	Elektron terbebas daripada logam yang dipanaskan. <i>Electrons are released from heated metal.</i>	✓

5.

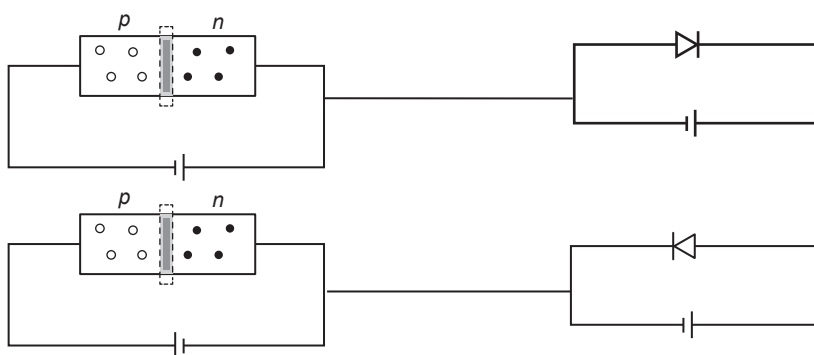


$$1.6 \times 10^{-19} (550) = \frac{1}{2} (9.11 \times 10^{-31}) (v^2)$$

$$v = 1.39 \times 10^7 \text{ m s}^{-1}$$

5.2 Diod Semikonduktor Semiconductor Diode

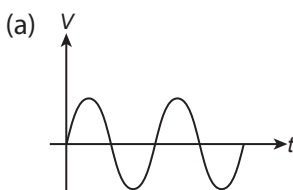
1.



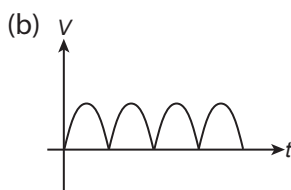
2.

- (a) ✗ (b) ✓ (c) ✗ (d) ✗

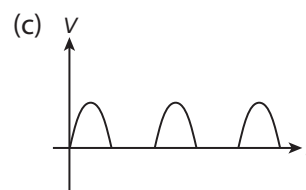
3.



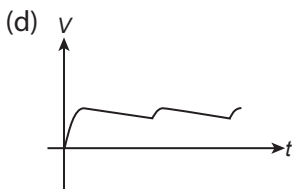
Litar 4
Circuit 4



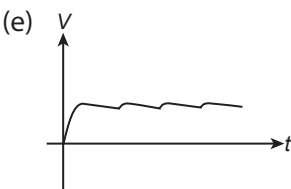
Litar 5
Circuit 5



Litar 2
Circuit 2

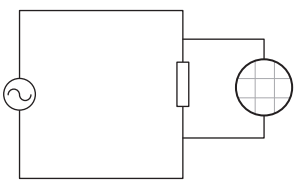
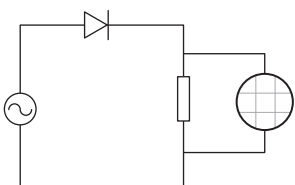
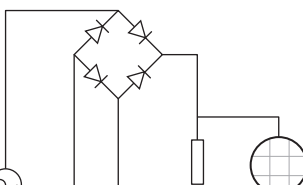
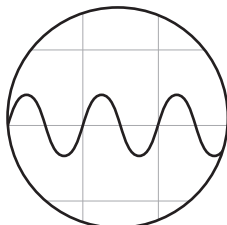
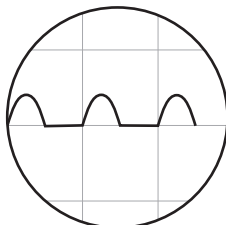
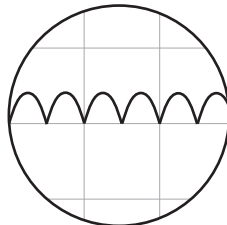


Litar 1
Circuit 1



Litar 3
Circuit 3

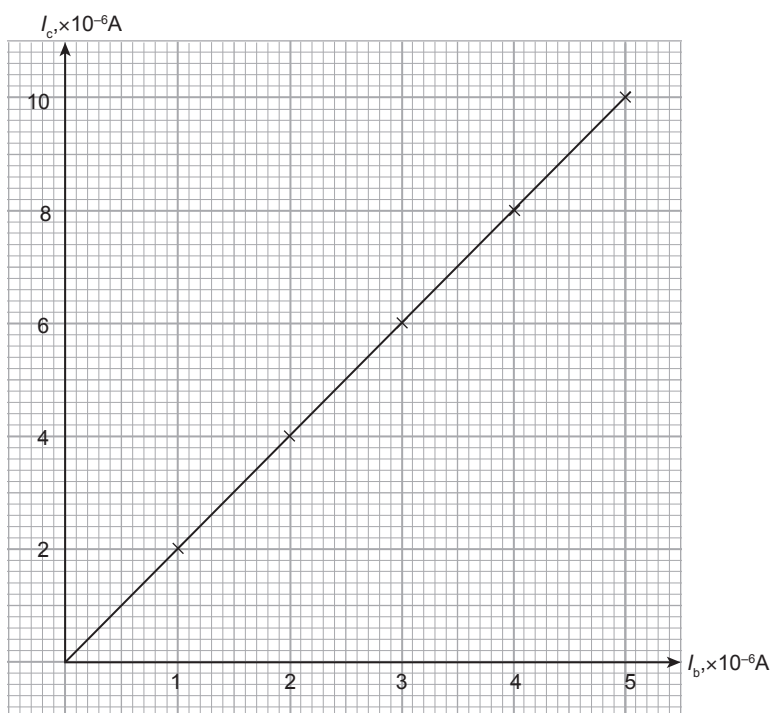
4.

(a) 	(b) 	(c) 
		

5. (b) ✓

5.3 Transistor

1. (a)



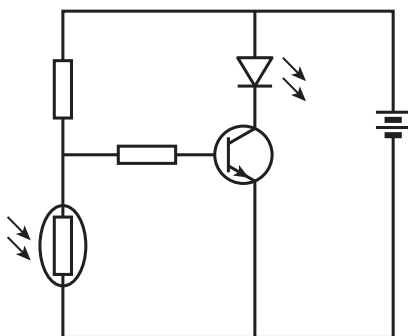
2. (a) ✓
(d) ✓

- (b) β = kecerunan graf,
gradient of graph

$$m = \frac{Y_2 - Y_1}{X_2 - X_1} = \frac{(5 - 0) \times 10^{-3} \text{ A}}{(2.5 - 0) \times 10^{-6} \text{ A}} = 2 \times 10^3$$

3. (a) Transistor
Transistor
(b) Perintang tetap
Fixed resistor
(c) Perintang peka cahaya
Light dependent resistor
(d) Diod pemancar cahaya
Light emitting diode (LED)

4.



PRAKTIS SPM 5

KERTAS 1

1. D 2. B 3. B 4. B

KERTAS 2

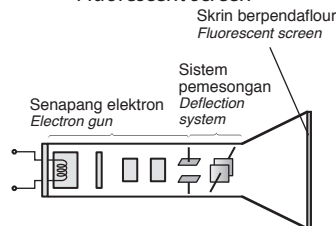
Bahagian A

1. (a) (i) Arus ulang-alik / Alternating current
(ii) Arus terus / Direct current
(b) Menukarkan arus ulang-alik kepada arus terus
Convert alternating current to direct current
(c) Rektifikasi / Rectification

Bahagian B

2. (a) (i) Pancaran termion ialah proses di mana elektron dibebaskan dari permukaan logam yang dipanaskan.
Thermionic emission is a process by which electrons are emitted from the surface of a heated metal.

- (ii) • Senapang elektron
Electron gun
• Sistem pemesanan
Deflection system
• Skrin berpendaflour
Fluorescent screen



- (b) (i) Voltan puncak / Peak voltage
= 2 divs $\times$ 0.3 V / div
= 0.6 V
(ii) Tempoh / Period, T
= 3 divs $\times$ 10 ms / div
= 30 ms
Frekuensi / Frequency, f
= $\frac{1}{T} = \frac{1}{30 \times 10^{-3}}$
= 33.3 Hz

(c)

Aspek Aspect	Ciri-ciri Characteristic	Penerangan Explanation
Jenis pengesan Type of detector	Termistor Thermistor	Rintangan bergantung kepada haba Resistance affected to heat
Kedudukan pengesan The position of the detector	Sebelum litar tapak Before the base circuit	Arus tapak besar apabila keadaan panas Large base current when the surrounding is hot
Kedudukan mentol The position of the bulb	Pada litar pengumpul At the base circuit	Mentol akan menyala apabila arus melalui litar pengumpul Bulb lights up when current flows through the collector current

Sambungan terminal sel kering <i>The connection of the terminal of the dry cells</i>	Terminal positif disambungkan pada terminal pengumpul <i>Positive terminal connected to the collector terminal</i>	Sambungan bateri adalah pincang hadapan <i>Connection of batteries is forward biased</i>
Pilihan: Litar D <i>Choice: circuit D</i> Alasan: <i>Reason</i> (i) Menggunakan termistor <i>Using thermistor</i> (ii) Kedudukan pengesan sebelum litar tapak <i>Detector placed before base circuit</i> (iii) Kedudukan mentol pada litar pengumpul <i>Bulb is positioned on collector circuit</i> (iv) Terminal positif sel kering disambungkan kepada terminal pengumpul <i>Positive terminal of dry cells is connected to the collector terminal</i>		

Bahagian C

3. (a) (i) Silicon / Germanium

Silikon / Germanium

- (ii) • Konduktor yang digunakan dalam Rajah 3.1 ialah semikonduktor manakala yang digunakan dalam Rajah 3.2 ialah dawai besi.

The conductor used in Diagram 3.1 is a semiconductor whereas in Diagram 3.2 it is an iron wire.

- Bacaan ammeter dalam Rajah 3.1 bertambah manakala bacaan ammeter dalam Rajah 3.2 menurun.

The ammeter reading in Diagram 3.1 is increasing while that in Diagram 3.2 is decreasing.

- Kedua-dua suhu dalam Rajah 3.1 dan Rajah 3.2 meningkat.

Both the temperatures in Diagram 3.1 and Diagram 3.2 rise.

- Peningkatan bacaan ammeter dalam Rajah 3.1 menunjukkan rintangan semikonduktor berkurang dengan peningkatan suhu.

The increment of the ammeter reading in Diagram 3.1 indicates that the resistance of the semiconductor decreases as the temperature increases.

- Penurunan bacaan ammeter dalam Rajah 3.2 menunjukkan rintangan dawai besi bertambah dengan peningkatan suhu.

Whereas the decrease of the ammeter reading in Diagram 3.2 indicates that the resistance of the iron wire increases as the temperature increases.

- (b) • Semikonduktor jenis-n dan jenis-p dihasilkan dengan kaedah pendopan.

The n-type and p-type semiconductors are produced by doping.

- Semikonduktor jenis-n dihasilkan ketika atom pentavalen digunakan sebagai pendopan.

The n-type semiconductor is produced when pentavalent atoms are used as the dopant.

- Semikonduktor jenis-p dihasilkan ketika atom trivalen digunakan sebagai pendopan.

The p-type semiconductor is produced when trivalent atoms are used as the dopant.

- Pembawa cas majoriti bagi semikonduktor jenis-n dan semikonduktor jenis-p masing-masing ialah elektron dan lohong.

The majority carriers for the n-type semiconductor and p-type semiconductor are electrons and holes respectively.

(c)

Aspek <i>Aspect</i>	Ciri-ciri <i>Characteristic</i>	Penerangan <i>Explanation</i>
Pengesan <i>Detector</i>	Perintang peka cahaya (PPC) <i>Light dependent resistor (LDR)</i>	Rintangan bergantung kepada keamatan cahaya <i>Resistance affected to intensity of light</i>
Kedudukan pengesan <i>Location of detector</i>	pada B <i>at B</i>	Arus tapak tinggi apabila keadaan sekeliling gela <i>High base current when the surrounding is dark</i>
Kedudukan perintang <i>Location of resistors</i>	pada A dan C <i>at A and C</i>	Mengawal arus yang mengalir pada transistor <i>Control the amount of current flowing through the transistor</i>
Kedudukan diod pemancar <i>Location of light emitting diode</i>	pada D <i>at D</i>	Mengeluarkan cahaya apabila arus melalui terminal pengumpul <i>Light is emitted when current flows through collector terminal</i>
Kedudukan transistor <i>Location of transistor</i>	pada E <i>at E</i>	Bertindak sebagai suis automatik <i>Act as an automatic switch</i>