

SECTION A : 80 MARKS**BAHAGIAN A : 80 MARKAH****INSTRUCTION:**

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

ARAHAN:

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

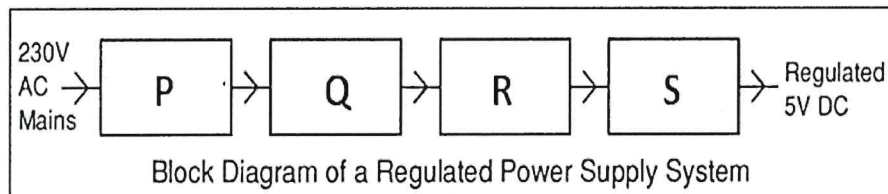
QUESTION 1**SOALAN 1**

Figure A1(a) / *Rajah A1(a)*

CLO1
C1

- a) Based on Figure A1(a), name the block for 'P', 'Q', 'R' and 'S'
Berdasarkan Rajah A1(a), namakan blok bagi 'P', 'Q', 'R' dan 'S'

[4 marks]
[4 markah]

CLO1
C2

- b) Based on Figure A1(a), explain the function for each block diagram of a simple Direct Current (DC) power supply.
Berdasarkan Rajah A1(a), terangkan fungsi bagi setiap gambarajah blok bekalan kuasa arus terus (AT).

[6 marks]
[6 markah]

CLO1
C3

c)

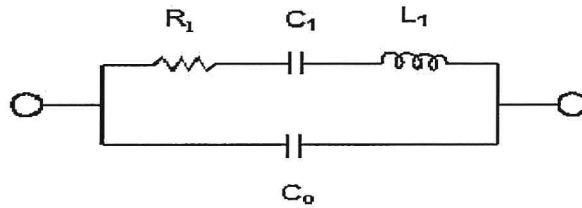


Figure A1(c) / Rajah A1(c)

Figure A1(c) shows the crystal equivalent circuit. If the values of $L = 2\text{H}$, $C_1 = 330\text{pF}$, $R = 2\text{k}\Omega$, and $C_0 = 0.75\text{nF}$. Calculate the series and parallel resonant frequency of the crystal.

Rajah A1(c) menunjukkan litar persamaan kristal. Jika nilai $L = 2\text{H}$, $C_1 = 330\text{pF}$, $R = 2\text{k}\Omega$, and $C_0 = 0.75\text{nF}$. Kirakan frekuensi ayunan sesiri dan selari untuk kristal tersebut.

[10 marks]

[10 markah]

QUESTION 2**SOALAN 2**CLO1
C1

- a) A monostable multivibrator has $R = 120\text{K}\Omega$ and the time delay $T = 1000\text{ms}$, give the value of C ?

Multivibrator monostabil mempunyai nilai $R = 120\text{k}\Omega$ dan masa lengah $T = 1000\text{ms}$, berikan nilai bagi C ?

[4 marks]

[4 markah]

CLO1
C2

- b) Compare **THREE (3)** differences between Astable multivibrator and monostable multivibrator?

*Bandingkan **TIGA (3)** perbezaan di antara multivibrator Astabil dan multivibrator Monostabil?*

[6 marks]

[6 markah]

CLO1
C3

- c) A 555 timer is connected as an astable multivibrator. Draw a timer circuit with $R_a = R_b = 7.5k\Omega$, $C = 0.1\mu F$ for electrolytic and $0.01\mu F$ for ceramic capacitor. Calculate the value of Time High (T_H), Time Low (T_L) and Time (T).

Pemasa 555 disambungkan dalam multivibrator astabil. Lukiskan litar pemasa tersebut dengan nilai $R_a = R_b = 7.5k\Omega$, $C = 0.1\mu F$ untuk jenis elektrolitik dan $0.01\mu F$ untuk kapasitor seramik. Kirakan nilai Tempoh Tinggi (T_H), Tempoh Rendah (T_L) dan Masa (T)

[10 marks]

[10markah]

QUESTION 3**SOALAN 3**CLO1
C1

- a) The graph in Figure A3(a) refers to frequency response curve for filter. Name the type of the filter and give the circuit diagram.

Graf rajah A3(a) merujuk kepada lengkung sambutan frekuensi untuk litar penapis. Namakan jenis penapis dan berikan gambarajah litar.

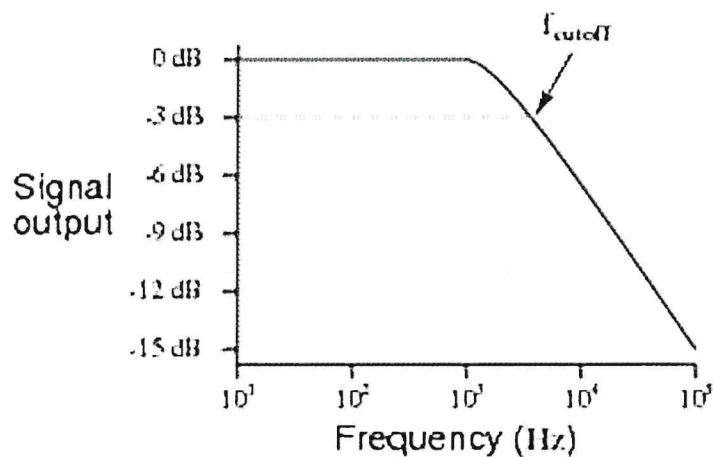


Figure A3(a) / Rajah A3(a)

[4 marks]

[4 markah]

CLO1
C2

- b) By referring to Figure A3(b), search the type of the filter circuit and visualize the frequency response curve graph.

Dengan merujuk kepada Rajah A3(b), dapatkan jenis litar penapis ini dan gambarkan graf sambutan frekuensi.

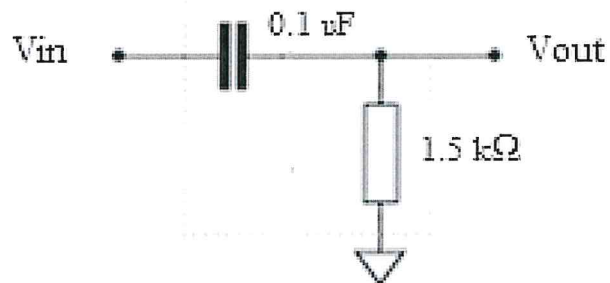


Figure A3(b) / Rajah A3(b)

[6 marks]
[6 markah]

CLO1
C3

- c) High pass filter circuit consists of $C = 20\text{nF}$ and $R = 10\text{k}\Omega$ while low pass filter circuit consists of $C = 500\text{pF}$ and $R = 10\text{k}\Omega$. Calculate the bandwidth.

Litar penapis lulus tinggi terdiri daripada $C = 20\text{nF}$ dan $R = 10\text{k}\Omega$ manakala litar penapis lulus rendah terdiri daripada $C = 500\text{pF}$ dan $R = 10\text{k}\Omega$. Kira lebar jalur.

[10 marks]
[10 markah]

QUESTION 4**SOALAN 4**

- CLO1
C1 a) Identify **FOUR (4)** types of basics method in converting digital to analog signal (DAC)

Kenalpasti EMPAT (4) jenis kaedah asas dalam menukarkan isyarat digital kepada analog.

[4 marks]

[4 markah]

- CLO1
C2 b) Explain **THREE (3)** applications of analog to digital converter (ADC)

Nyatakan TIGA (3) aplikasi penukar Analog ke Digital (ADC)

[6 marks]

[6 markah]

- CLO1
C3 c) Sketch a block diagram of Successive Approximation ADC and briefly explain the operation.

Lakarkan gambarajah blok Successive Approximation ADC dan terangkan kendaliannya

[10 marks]

[10 markah]

SECTION C : 20 MARKS
BAHAGIAN C : 20 MARKAH

INSTRUCTION:

This section consists of **ONE (1)** essay questions. Answer **ALL** the question.

ARAHAN:

*Bahagian ini mengandungi **SATU (1)** soalan esei. Jawab **SEMUA** soalan tersebut.*

QUESTION 1

SOALAN 1

CLO1
C3

A Inverting summing amplifier is an op amp circuit that combines several inputs and produces an output that is the weighted sum of the inputs. Carry out the output voltage equation (V_o) by drawing the Inverting summing amplifier which has **TWO (2)** inputs. Hence, calculate the current input I_1 , I_2 and output voltage if $R_F = 10k\Omega$, $R_1 = 5k\Omega$ and $R_2 = 2.5k\Omega$, input voltage $V_1 = 2V$ and $V_2 = 1V$. Draw the waveforms of the input and output simultaneously.

*Penguat penjumlahan alikan adalah litar penguat kendalian yang menggabungkan beberapa masukan dan menghasilkan keluaran yang merupakan jumlah masukan. Nyatakan persamaan voltan keluaran (V_o) dengan menggambarakan penguat penjumlahan terbalik yang ada **DUA (2)** masukan. Oleh itu, kirakan arus masukan I_1 , I_2 , voltan keluaran jika $R_F = 10k\Omega$, $R_1 = 5k\Omega$ dan $R_2 = 2.5k\Omega$, voltan masukan $V_1 = 2V$ dan $V_2 = 1V$. Lukiskan bentuk gelombang masukan dan keluaran secara serentak.*

[20 marks]

[20 markah]

SOALAN TAMAT