Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020

COURSE NAME	:	ELECTRONICS II
COURSE CODE	:	BWC 20203
PROGRAMME CODE	:	BWC
EXAMINATION DATE	:	DECEMBER 2019 / JANUARY 2020
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **EIGHT (8)** PAGES

Q1 (a) Determine **THREE (3)** advantages of integrated circuit (ICs) over conventional circuit.

(3 marks)

(b) Determine the closed loop gain for each of the amplifier in **Figure Q1 (b) (i)** and **Figure Q1 (b) (ii)**.

(6 marks)

(c) Calculate the value of feedback resistance, R_f that will produce the indicated closed loop gain, A_{cl} in each amplifier in **Figure Q1 (c).**

(5 marks)

(d) Determine the output voltage for the circuit in **Figure Q1 (d)** with a sinusoidal input of 3.0 mV.

(6 marks)

(e) (i) Determine the input and output resistances of the amplifier circuit in **Figure Q1 (e)**. The op-amp data sheet gives R_{in} = 2 MΩ, R_{out} = 75 Ω and A_{ol} = 200,000.

(6 marks)

(ii) Calculate the close loop gain, A of the amplifier.

(3 marks)

Q2 (a) Describe **TWO (2)** types of active filters and draw an example of the circuit.

(i) Active filter

(2 marks)

(ii) Passive filter

(2 marks)

(b) Calculate the capacitance values required to produce a 3 kHz critical frequency in the low pass filter as in **Figure Q2 (b).**

(8 marks)

(c) **Figure Q2 (c)** shows a circuit for the combination of high pass and low pass filter. Determine,

(i) the bandwidth of the circuit;

(4 marks)

(ii) center of the frequency.

(4 marks)

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(d) Calculate the resonance frequency, f_0 and the band width, BW for the band pass filter circuit in **Figure Q2 (d)**.

(5 marks)

Q3 (a) Calculate the following codes;

(i) $(11001)_2 + (101)_2 = 11110$

(2 marks)

(ii) $(11010)_2 - (10101)_2 = 00101$

(2 marks)

(iii) $(1101)_2 \times (1001)_2 = 1110101$

(2 marks)

(iv) $(101101)_2 \div (110)_2 = 111$

(2 marks)

(b) (i) Simplify the logic expression, A+B'C + (A(B+C')) and draw a schematic for the circuit that implements the simplified expression.

(6 marks)

(ii) Draw a schematic for a circuit that directly implements the logic function A+B'C+ (A(B+C')).

(6 marks)

(c) Show the behavior of the logic circuit in **Figure Q3 (c)** with a truth table.

(6 marks)

Q4 (a) Describe two differences between latches and flip-flop.

(4 marks)

(b) State the characteristic equations and the excitation tables for the SR and JK flip-flops.

(6 marks)

(c) A flip-flop 7474 integrated circuit is supplied with a waveform in their input, S and R as in **Figure Q4(c)**. Sketch the output diagram at Q and state the function at each sequence.

(10 marks)

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– **END OF QUESTIONS** –

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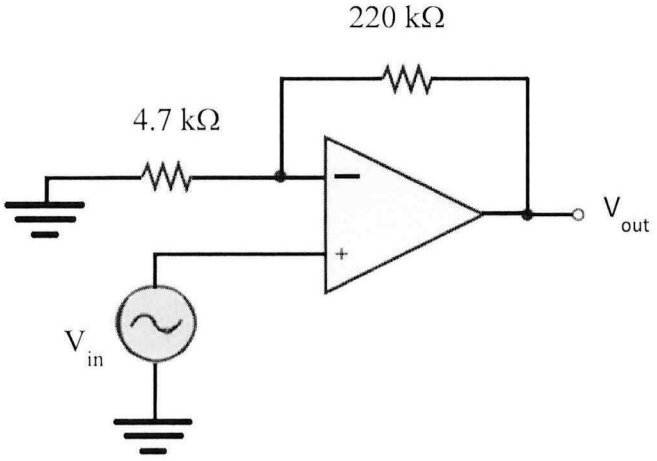

Figure Q1 (b) (i)

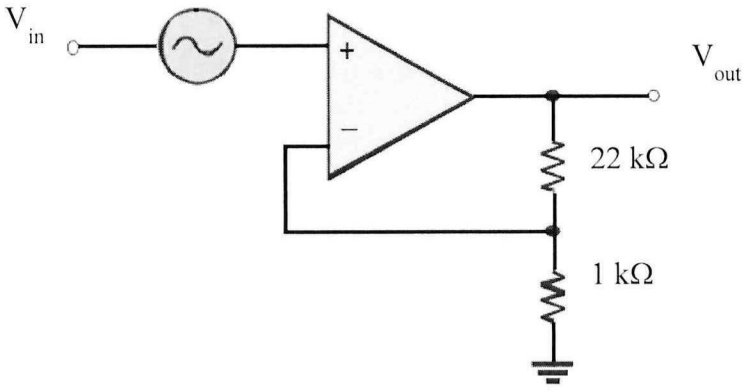

Figure Q1 (b) (ii)

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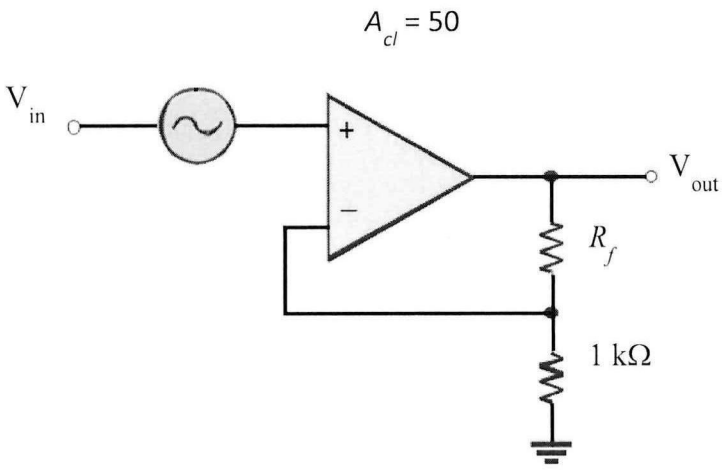

Figure Q1 (c)

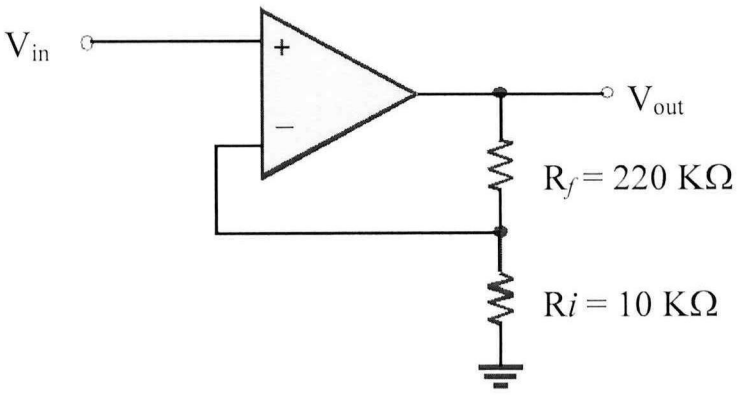

Figure Q1 (d)

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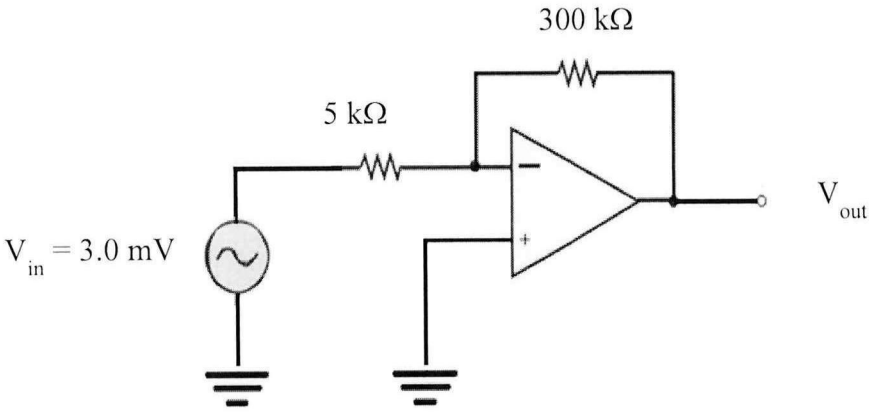

Figure Q1 (e)

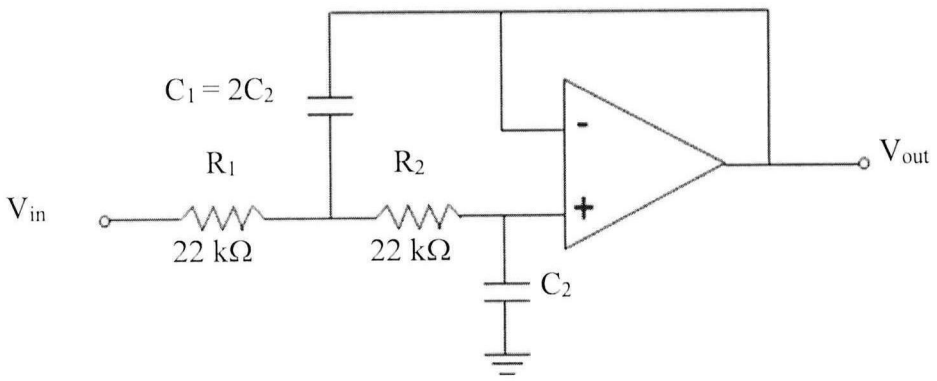

Figure Q2 (b)

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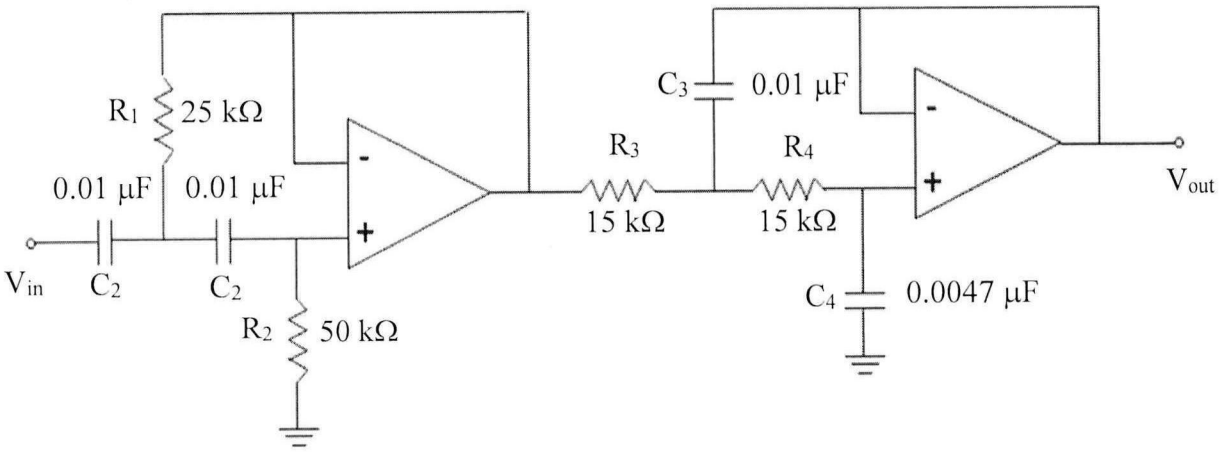

Figure Q2 (c)

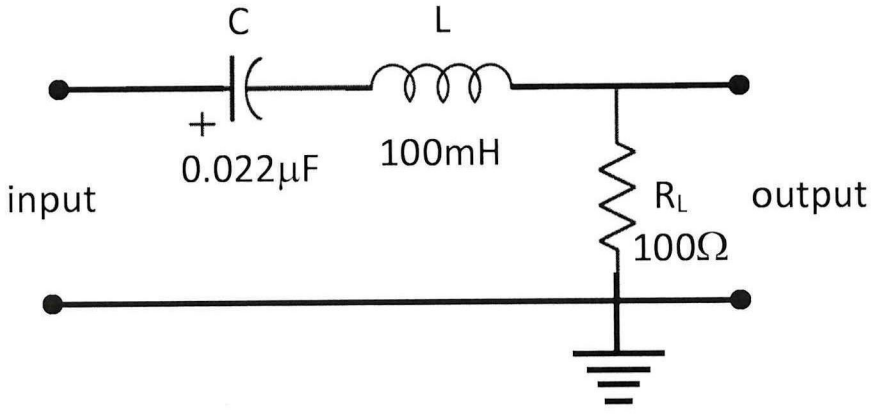

Figure Q2 (d)

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COURSE NAME : FIBER OPTICS
PROGRAMME CODE : BWC
COURSE CODE : BWC 40703

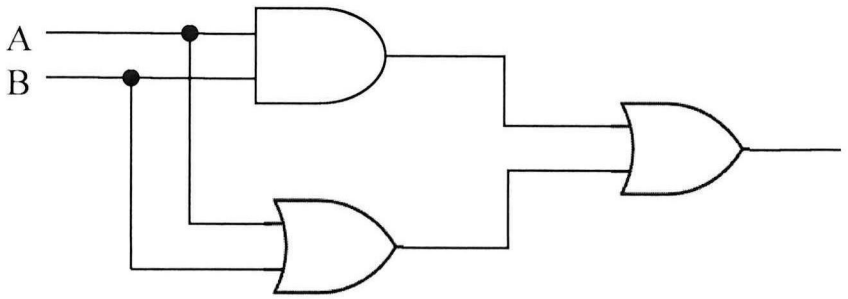

Figure Q3 (c)

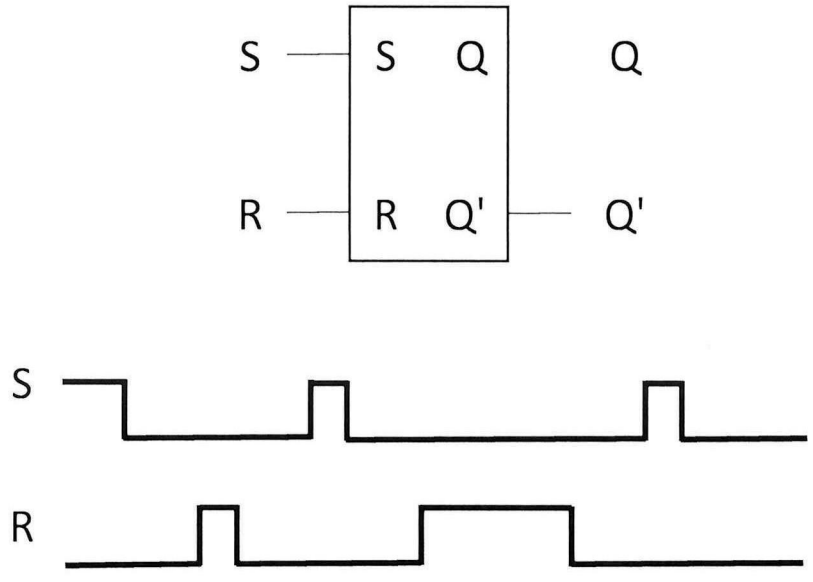

Figure Q4 (c)

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