

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
300 level 2nd Semester Examination – Dec./Jan. 2016/17
SCT 366-2 Digital and Analog Electronics



Instructions to candidates

Duration: Two (02) hours

Number of questions: Four (04) Essay Questions

Mark allocation: 100 mark

Answer all questions.

Calculators are allowed.



- 1.
- a. Find out
 - i. the binary equivalent of the decimal number 368.
 - ii. the decimal equivalent of hex number 1A53.
 - iii. the value of x , given that $(16)_{10} = (100)_x$.

(05 mark)
 - b. State and explain De Morgan's theorems with relevant truth tables.

(10 mark)
 - c. Simplify the Boolean expression for the following statements.
 - i. $(ABC) + (ABC)$
 - ii. $A.B + A.B + A.B$
 - iii. $(A + B)(A + C)(B + C)$

(05 mark)
 - d. Which gates are called as universal gates? What are its advantages?

(05 mark)
- 2.
- a.
 - i. Explain the working of multiplexer.

(05 mark)
 - ii. What is a demultiplexer?

(03 mark)
 - iii. Discuss the differences between a demultiplexer and a decoder.

(05 mark)

b. What is a digital comparator. Explain the working of a 2-bit digital comparator with the help of Truth Table. (06 mark)

c. Design 4-to-16 Decoder from two 3-to-8 Decoders. (06 mark)

3.

a. What is the difference between **latch** and **flip-flop**? (05 mark)

b. List out the application of **flip-flop**. (05 mark)

c. What is a half-adder? Explain a half-adder with the help of truth-table and logic diagram. (08 mark)

d. Explain the working of a 4-bit SISO shift register by using D-Flip flops and waveforms. (07 mark)

4.

a. Compare and contrast the conduction angle amplifiers of class A,B,C and AB. (04 mark)

b. Briefly explain the frequency response curve of an amplifier. (05 mark)

c. Prove that an amplifier's gain drops by -3dB at the cut off frequency. (06 mark)

d. Below operational amplifier(Figure 01) is made to operate according to following specifications.

Voltage gain (A)	= 10
Input resistance (at mid band)	= 10k Ω
Lower cut off frequency (f1)	= 250 Hz
Upper cut off frequency (f2)	= 15kHz

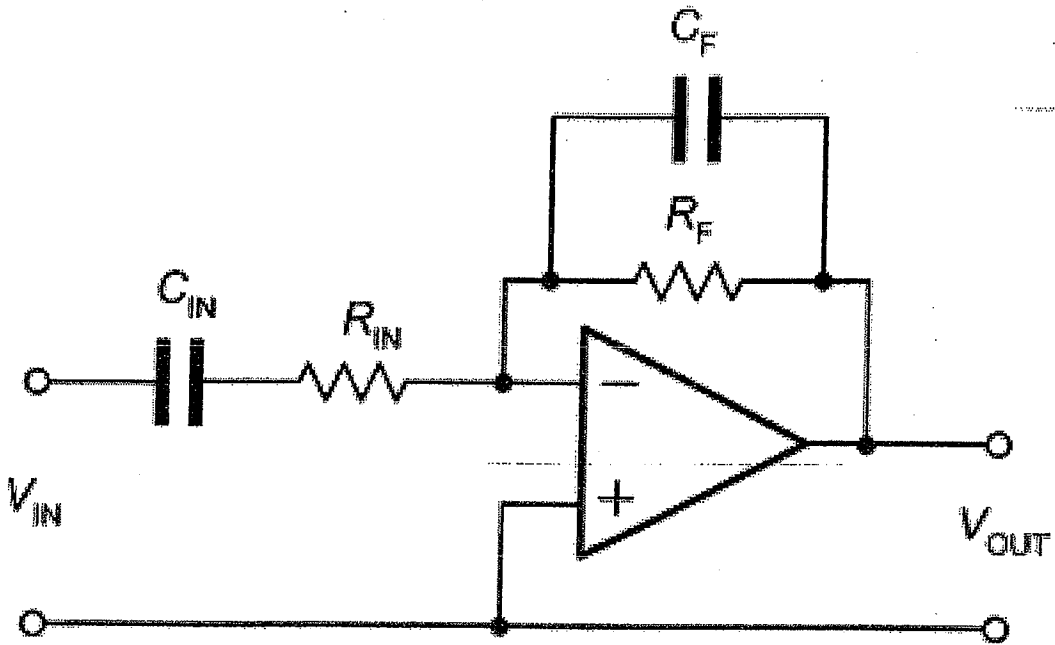


Figure 01: Operational Amplifier

Obtain the values for C_{IN} , R_F and C_F

(10 mark)

