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NPTL

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# Unit 13 - Week 12

## Course outline

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- Week 12 Slides PDF
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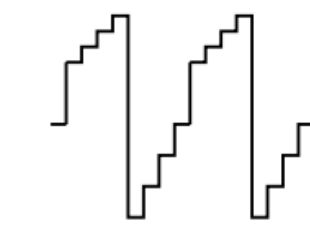
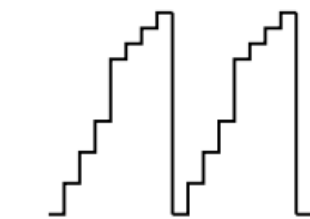
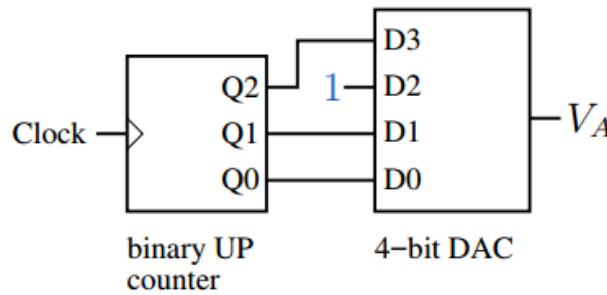
## Assignment-12

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2018-04-18, 23:59 IST**

1 point

1) For the circuit shown in the figure, which waveform correctly describes  $V_A(t)$ ?



Assignment-12  
Solutions

No, the answer is incorrect.

Score: 0

Accepted Answers:



2) The full-scale input for an ADC is  $10\text{ V}$ . The minimum resolution required is  $5\text{ mV}$ . What is the minimum number of bits required for the ADC? **1 point**

- 9
- 10
- 11
- 12

No, the answer is incorrect.

Score: 0

Accepted Answers:

11

3) In what way a flash ADC is superior to other ADC types? **1 point**

- It has a high resolution.
- It offers a high conversion speed.
- It is more immune to noise.
- It has a low component count.

No, the answer is incorrect.

Score: 0

Accepted Answers:

*It offers a high conversion speed.*

4) The resolution of an 8-bit DAC is  $39\text{ mV}$ . What would be the output voltage for an input of 0110 1110? **1 point**

- $4.29\text{ V}$
- $3.56\text{ V}$
- $6.27\text{ V}$
- $3.85\text{ V}$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$4.29\text{ V}$

5) A 10-bit ADC gives 10 1000 1000 when an input voltage of  $3.164\text{ V}$  is applied. The full-scale input of the ADC is **1 point**

- $10\text{ V}$
- $15\text{ V}$
- $8\text{ V}$



5 V

No, the answer is incorrect.

Score: 0

Accepted Answers:

5 V

6) When an input voltage of 1.785 V is applied to the ADC of Q-5, what output is expected?

1 point

- 00 1010 1100
- 01 0110 1101
- 01 1001 1110
- 00 1001 1100

No, the answer is incorrect.

Score: 0

Accepted Answers:

01 0110 1101

7) A 10-bit counter type ADC operates with a clock frequency of 1 MHz. What is the maximum number of samples it can process per second?

- 765
- 1240
- 976
- 1124

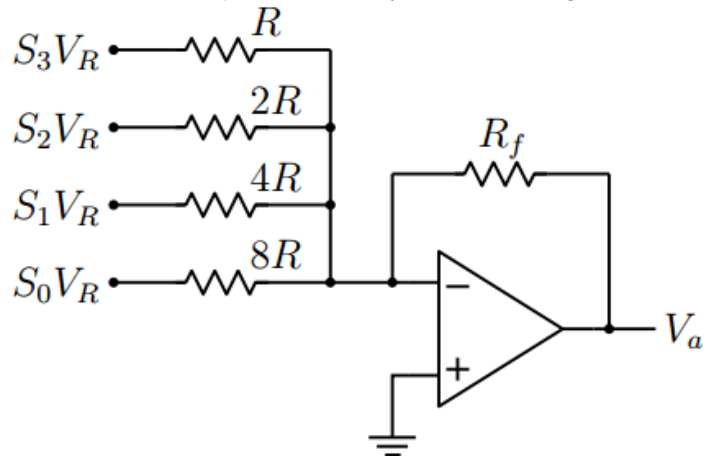
No, the answer is incorrect.

Score: 0

Accepted Answers:

976

8) In the weighted-resistor DAC shown in the figure,  $R_f = R$ ,  $V_R = -5V$ , and the op-amp can be considered to be ideal. Assume the resistance values to be perfect, i.e., exactly as shown in the figure. What is  $V_a$  for



$S_3S_2S_1S_0 = 1011$  ?

- 6.25 V
- 6.75 V
- 6.875 V
- 7.25 V

No, the answer is incorrect.

Score: 0



**Accepted Answers:**

6.875 V

9) In the DAC of Q-8, suppose all resistances have a 2 % tolerance. For  $S_3S_2S_1S_0 = 1011$ , what is the worst-case deviation (magnitude) in  $V_a$  from its expected value? **1 point**

- 0.16 V
- 0.28 V
- 0.22 V
- 0.08 V

**No, the answer is incorrect.****Score: 0****Accepted Answers:**

0.28 V

10) In the DAC of Q-8, we want to limit the deviation in  $V_a$  from its expected value for  $S_3S_2S_1S_0 = 1011$  to 0.2 %. What is the minimum tolerance required for the resistances? **1 point**

- 0.1 %
- 0.2 %
- 0.05 %
- 0.25 %

**No, the answer is incorrect.****Score: 0****Accepted Answers:**

0.1 %

11) A 10-bit counter type ADC operates with a clock frequency of 1 MHz. The worst-case conversion time per sample is about **1 point**

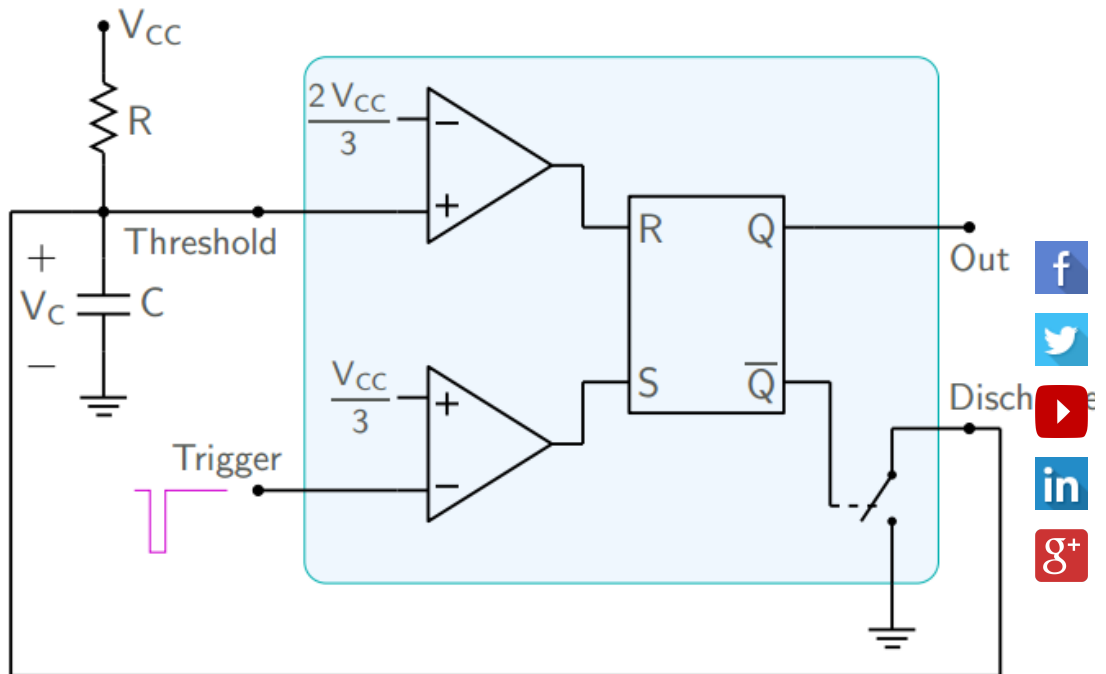
- 1 msec
- 0.5 msec
- 10  $\mu$ sec
- 0.25  $\mu$ sec

**No, the answer is incorrect.****Score: 0****Accepted Answers:**

1 msec

12) In the monostable multivibrator shown in the figure,  $V_{CC} = 5 V$ , and  $C = 50 \mu F$ . When a negative-going trigger is applied, we want to get a 1-sec output pulse. What value of  $R$  is appropriate? **1 point**





- 22 kΩ
- 26.9 kΩ
- 15.5 kΩ
- 18.2 kΩ

No, the answer is incorrect.

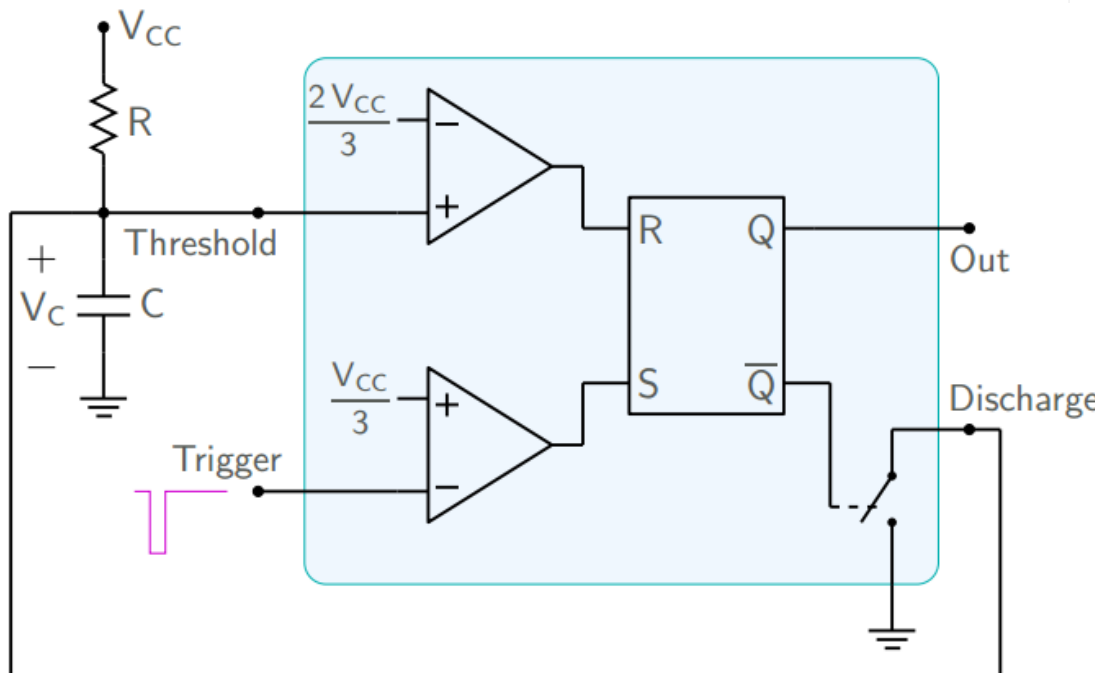
Score: 0

Accepted Answers:

18.2 kΩ

13) When a negative-going trigger is applied to the monostable multivibrator of Q-12 (repeated below),  $V_C$  varies between

1 point



- 0 V and 5 V

0 V and 3.33 V

1.67 V and 3.33 V

0 V and 1.67 V

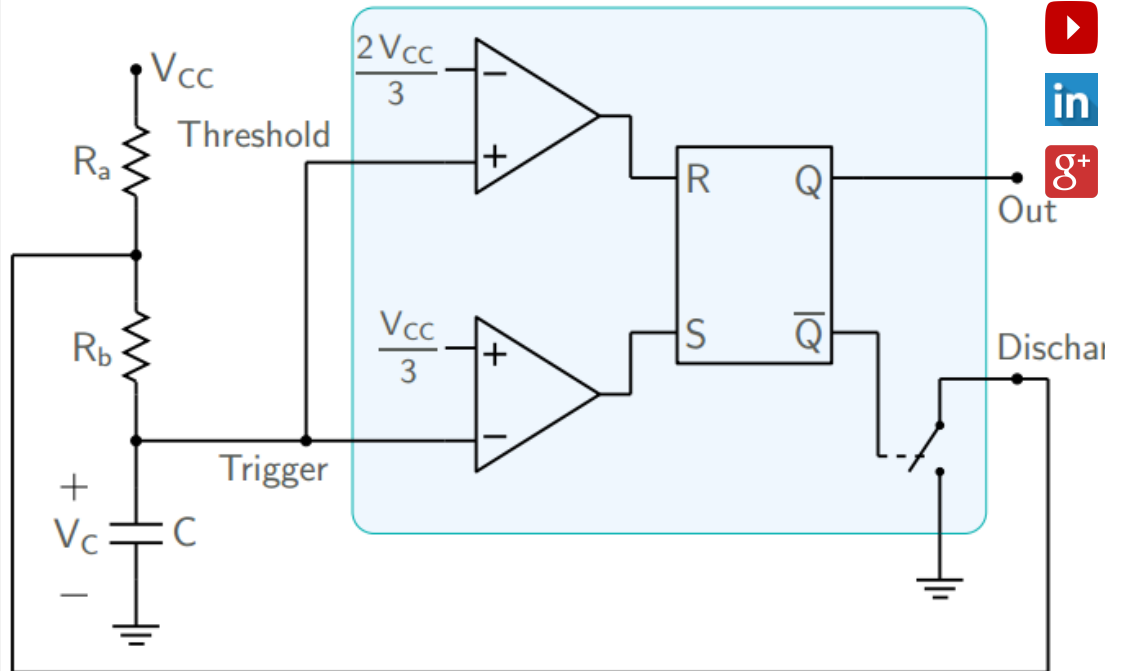
No, the answer is incorrect.

Score: 0

Accepted Answers:

0 V and 3.33 V

14) In the astable multivibrator shown in the figure, let  $T_H$  denote the interval of high  $V_o$  and  $T_L$  denote the interval of low  $V_o$ . Which of the following statements is correct?



$V_C$  varies between 0 V and  $\frac{2V_{CC}}{3}$ .

$T_L$  increases as  $R_a$  is increased.

$T_L$  increases as  $R_b$  is increased.

$T_H$  is independent of  $R_b$ .

No, the answer is incorrect.

Score: 0

Accepted Answers:

$T_L$  increases as  $R_b$  is increased.

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