Quiz 04 Basic Components

總分 100/100

NCTU EELAB Fall

區段分數 0/0

Class *

- ○ DEE222
- ◉ DEE320

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Name *

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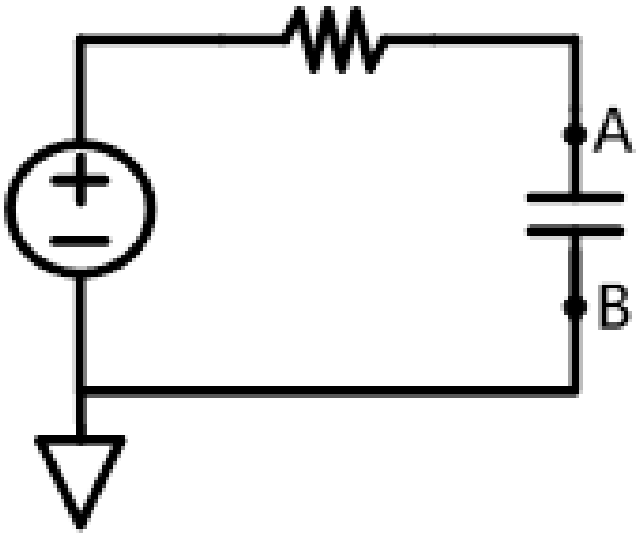
Q1. Answer the following questions about capacitors.

區段分數 20/20

✓ (1) Mark the polarity of capacitor below. * 5/5

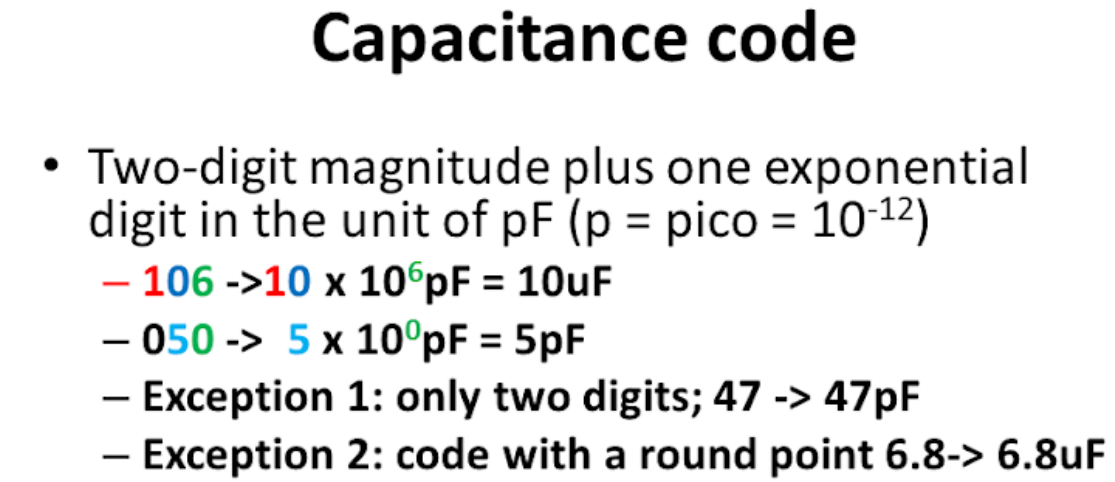
- (●) X : high potential , Y : low potential ✓
- ( ) X : low potential , Y : high potential
- ( ) There is no difference between X and Y pins.

✓ (2) Following the previous question, look at the circuit below, how should you connect the capacitor between node A and B? * 5/5



- (●) X-A , Y-B ✓
- ( ) X-B , Y-A
- ( ) Both ways is ok.

(3) According to the capacitance code, identify the value of capacitors a and b.



✓ a. * 5/5

- 5 μF
- 0.5 μF
- 0.05 μF ✓

✓ b *

5/5

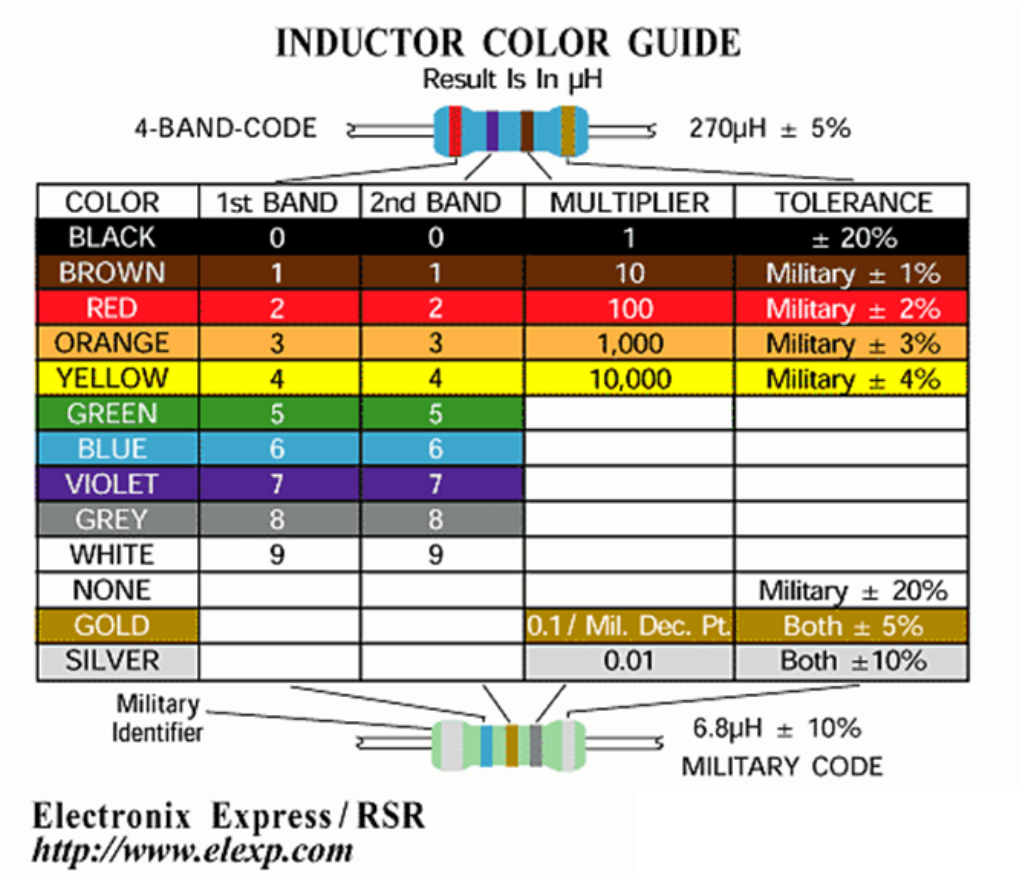
- 4.7 pF
- 4.7 μF ✓
- 47 μF

Q2. Answer the following questions about inductors.

區段分數 30/30

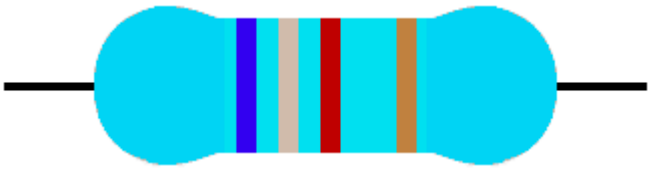
HINT

How to read the inductance



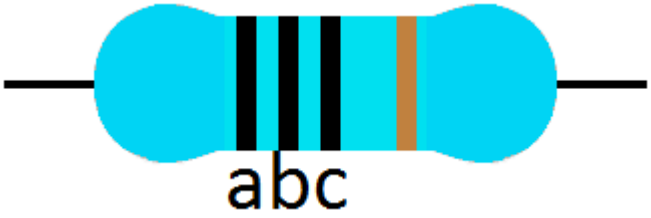
COLOR	1st BAND	2nd BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	1	± 20%
BROWN	1	1	10	Military ± 1%
RED	2	2	100	Military ± 2%
ORANGE	3	3	1,000	Military ± 3%
YELLOW	4	4	10,000	Military ± 4%
GREEN	5	5		
BLUE	6	6		
VIOLET	7	7		
GREY	8	8		
WHITE	9	9		
NONE				Military ± 20%
GOLD			0.1 / Mil. Dec. Pt.	Both ± 5%
SILVER			0.01	Both ±10%

✓ (1) According the color code, identify the value of inductor. 15/15
*colors from left to right : blue . grey . red . gold *



- ○ 6.8 µH ±5%
- ○ 680 µH ±5%
- ◉ 6.8 mH ±5% ✓

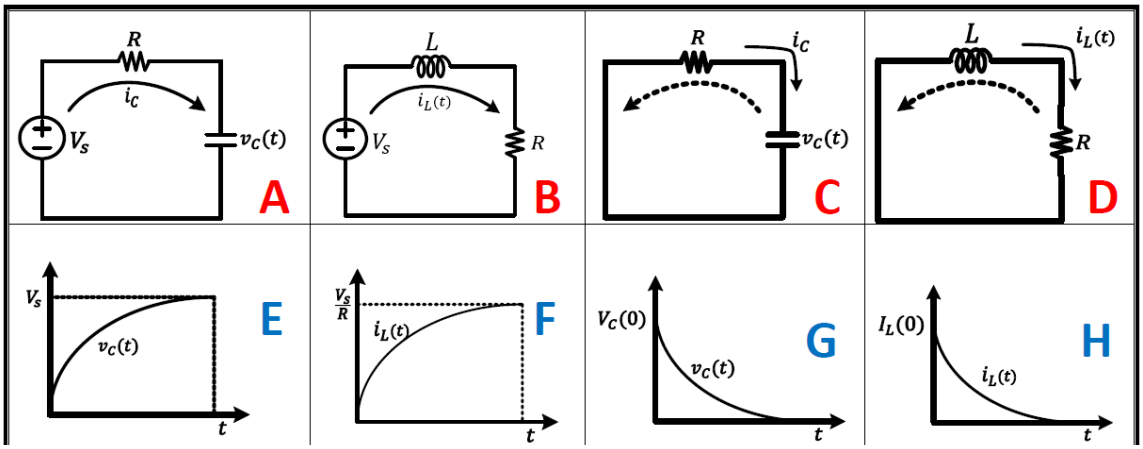
✓ (2) Given a 1 mH inductor with 5% error, what is the color code? * 15/15



- (a , b , c) = (black , brown , orange)
- (a , b , c) = (black , brown , red)
- (a , b , c) = (brown , black , black)
- (a , b , c) = (brown , black , red) ✓

Q3. In Lab4, we'll do the experiments about basic RC and RL circuits, try to match the corresponding diagrams and formulas respectively.

區段分數 50/50



I $v_C(t) = V_s(1 - e^{-t/RC})$	J $v_C(t) = V_C(0)e^{-t/RC}$	K $i_L(t) = \frac{V_s}{R}(1 - e^{-\frac{R}{L}t})$	L $i_L(t) = I_L(0)e^{-\frac{R}{L}t}$

✓ (1) Find the diagrams and formulas of RC circuit in charging state. * 10/10

- [x] A ✓
- [ ] B
- [ ] C
- [ ] D
- [x] E ✓
- [ ] F
- [ ] G
- [ ] H
- [x] I ✓
- [ ] J
- [ ] K
- [ ] L

✓ (2) Find the diagrams and formulas of RC circuit in discharging state. * 10/10

- [ ] A
- [ ] B
- [x] C ✓
- [ ] D
- [ ] E
- [ ] F
- [x] G ✓
- [ ] H
- [ ] I
- [x] J ✓
- [ ] K
- [ ] L

✓ (3) Find the diagrams and formulas of RL circuit in charging state. * 10/10

- [ ] A
- [x] B ✓
- [ ] C
- [ ] D
- [ ] E
- [x] F ✓
- [ ] G
- [ ] H
- [ ] I
- [ ] J
- [x] K ✓
- [ ] L

✓ (4) Find the diagrams and formulas of RL circuit in discharging state. * 10/10

- [ ] A
- [ ] B
- [ ] C
- [x] D ✓
- [ ] E
- [ ] F
- [ ] G
- [x] H ✓
- [ ] I
- [ ] J
- [ ] K
- [x] L ✓

✓ (5) Given R=1 kΩ , C=0.05 μF , L=1 mH, calculate the closest answers of time constant τ_RC and τ_RL. * 10/10

- ( ) (τ_RC , τ_RL) = (50 ps , 1 μs)
- ( ) (τ_RC , τ_RL) = (50 μs , 1 s)
- (•) (τ_RC , τ_RL) = (50 μs , 1 μs) ✓