Bách Khoa University (BKU), HCM City
Faculty of Computer Science and Engineering

Full Name:.....
Student ID: .....

Mid Term Exam – BK182 / 2018-2019

Môn: Electronics Devices
Lecture: Lê Trọng Nhân
Exam Code: 1821

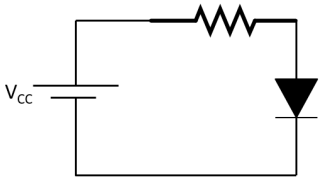
Duration: 75 minutes
Date: 29-03-2019

Refferences are not allowed!!!

I. Multiple choice (30 points): Pick **ONLY ONE** correct answer into the table bellow.

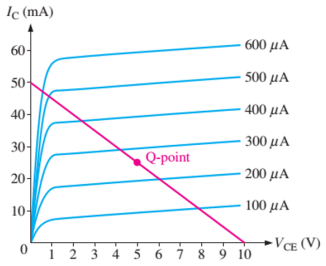
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15

1. Determine the drop-down voltage of the diode with V_{CC} = 12V, R = 220 Ohm and I = 51.63mA.



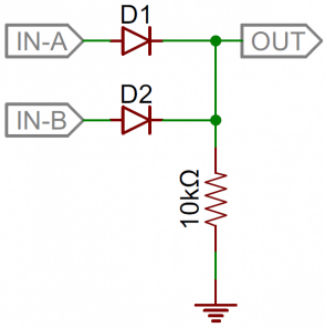
(a) 0.3V
(b) 0.64V
(c) 0.7V
(d) All are wrong

2. Follows figure is the characteristics of NPN transistor. What is the approximate saturation current (I_{SAT})?



(a) 500muA
(b) 400muA
(c) 60mA
(d) 50mA

3. What is the equivalent logic gate using two



diodes as follows?

(a) AND
(b) OR
(c) NOT
(d) All are not correct

4. When there is a current passing through a diode, its voltage is

(a) Proportional to the current
(b) Invert proportional to the current
(c) Almost a constant value
(d) Proportional to the voltage supply

5. When a transistor is used as a switch having two different states ON and OFF, it is stable in which two distinct modes bellow?

(a) Saturation and Amplifier modes
(b) Amplifier and Cut-off modes
(c) Saturation and Cut-off modes
(d) All are not correct

6. Testing a good diode with an ohmmeter should indicate

   (a) high resistance when reverse biased (cursor stops) and low resistance (cursor moves) when forward biased

   (b) low resistance when forward or reverse biased (cursor moves)

   (c) high resistance when forward or reverse biased (cursor stops)

   (d) high resistance when forward biased (cursor stops) and low resistance when reverse biased (cursor moves)

7. For a silicon transistor, when a base-emitter junction is forward-biased, it has a nominal voltage drop of

   (a) 0.3V

   (b) 0.7V

   (c) V_{CC}

   (d) Cannot determine

8. A certain BJT in amplifier mode having $I_B = 167uA, I_C = 15mA$, the amplifier DC factor is:

   (a) 15

   (b) 167

   (c) 90

   (d) All are not correct

9. In the case of Short Circuit, the current flows in the circuit is.

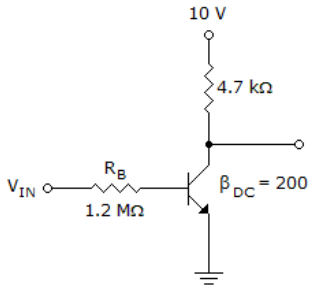
   (a) Zero

   (b) Very low

   (c) Normal

   (d) Infinite

10. Refer to the figure bellow, it is assumed that the transistor is in saturation mode. If $V_{CE} = 0.2V$ in this state, what is the value of $I_{C(sat)}$?



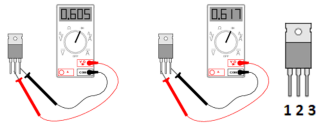
   (a) 0mA

   (b) 2.08mA

   (c) 2.12mA

   (d) Cannot determine due to a null value of V_{IN}

11. Following figure is the "diode checking" for an NPN transistor using a multi-meter. It is assumed that the pin of this transistor is 1, 2 and 3 (see the figure below). What is the Base pin?



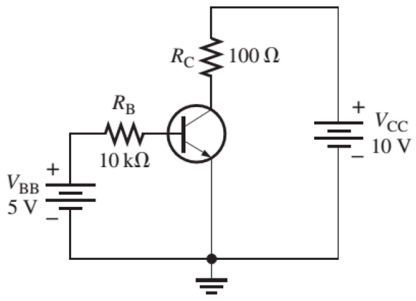
   (a) 1

   (b) 2

   (c) 3

   (d) Can not determine

12. According to the circuit bellow, if V_{BB} is increased slowly from 0V to 5V. What is the sequence operation modes of the transistor NPN listed bellow is correct?



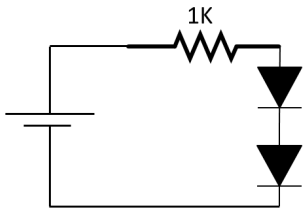
   (a) Cut-off, Amplifier and then, Saturation

   (b) Cut-off, Saturation and then, Amplifier

   (c) Amplifier, Saturation and then, Cut-off

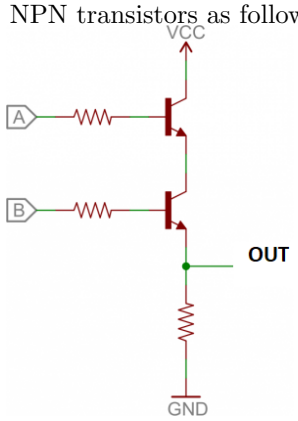
   (d) Saturation, Amplifier and then, Cut-off

13. The voltage supply is 9V, the drop-down voltage of each diode is 0.7V. Determine the current in the circuit.



(a) 9mA
(b) 8.3mA
(c) 7.6mA
(d) All are wrong

14. What is the equivalent logic gate using two NPN transistors as follows?



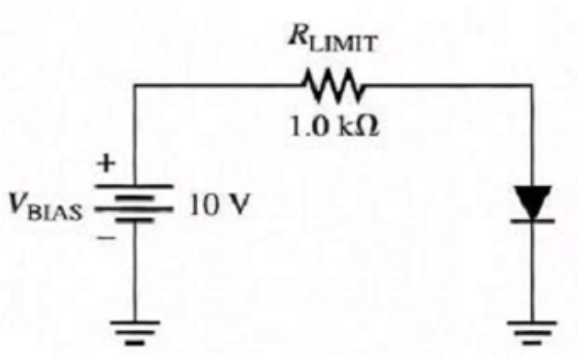
(a) AND
(b) OR
(c) NOT
(d) All are not correct

15. The value of the current passing through a diode in the diode bridge (used to rectify the DC current) is:

(a) A half of the current going through the load
(b) Double the current passing through load
(c) By the exact current passing through the load
(d) A quarter of the current passing through the load

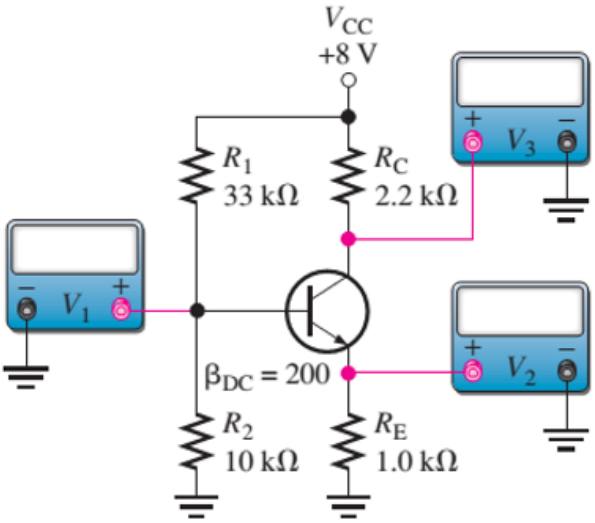
II. Essay (80 points): Student presents your answers in **Examination Paper**

1. (30 points) Given a diode circuit with forward bias voltage $V_F = 0.7V$, $r_d = 10Ohm$



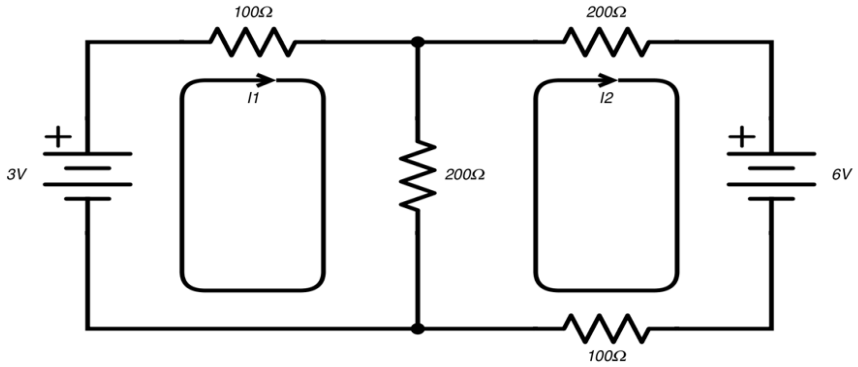
Determine V_F, I_F and V_{RLIMIT} by using Ideal (10 points), Practical (10 points) and Complete diode models (10 points).

(30đ) Refer to the following circuit:



- Determine V_1 (10 points) , V_2 (10 points), V_3 (10 points)

(20đ) Refer to the following circuit:



- Determine I1 (10 points), I2 (10 points)

END.

Head of Department

Lecturer

Lê Trọng Nhân

Answer 1821

I. Multiple choice (30 points): Pick **ONLY ONE** correct answer into the table bellow.

1. (b)
2. (d)
3. (b)
4. (c)
5. (c)
6. (a)
7. (b)
8. (c)
9. (d)
10. (b)
11. (c)
12. (b)
13. (c)
14. (a)
15. (c)

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1.
2.
3.

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Lecture: Lê Trọng Nhân
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   (a) 0.3V
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2. When there is a current passing through a diode, its voltage is
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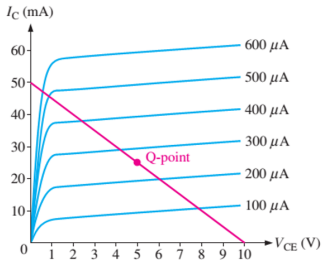

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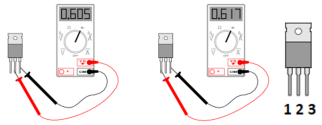

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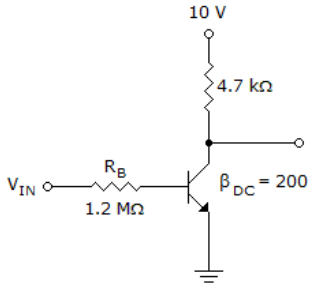

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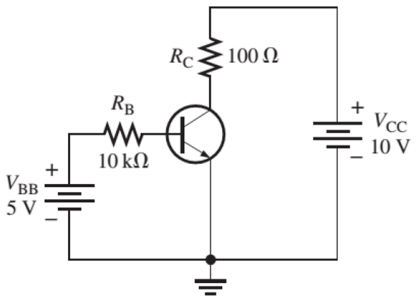

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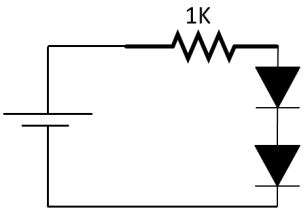

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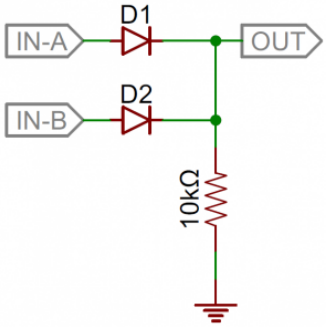

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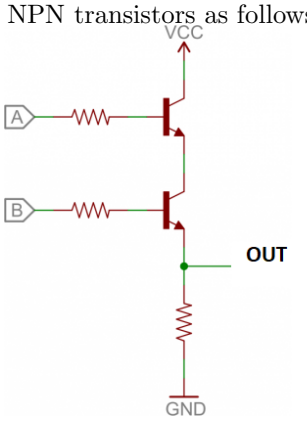

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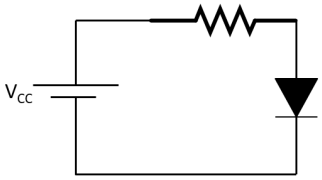

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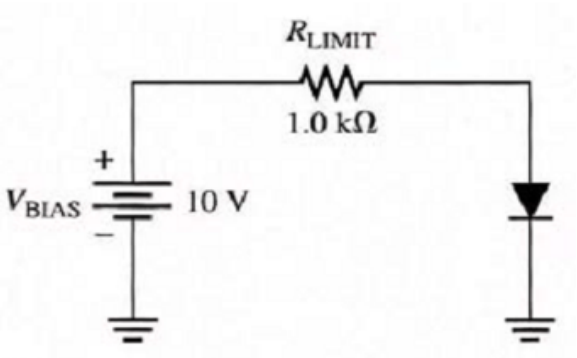

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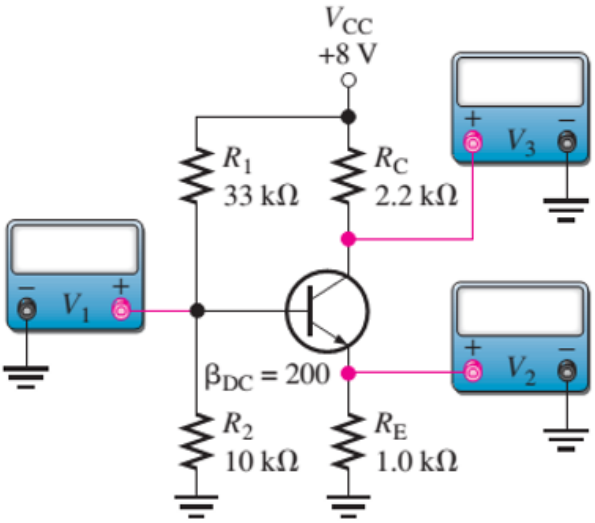

- Determine V_1 (10 points) , V_2 (10 points), V_3 (10 points)

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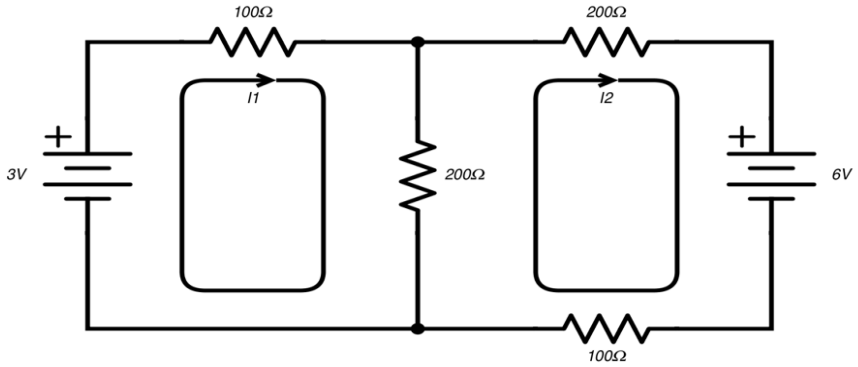

- Determine I1 (10 points), I2 (10 points)

END.

Head of Department

Lecturer

Lê Trọng Nhân

Answer 1822

I. Multiple choice (30 points): Pick **ONLY ONE** correct answer into the table bellow.

1. (b)
2. (c)
3. (d)
4. (c)
5. (b)
6. (c)
7. (b)
8. (c)
9. (c)
10. (c)
11. (b)
12. (a)
13. (a)
14. (d)
15. (b)

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1.
2.
3.