Started on	Wednesday, 13 December 2017, 9:56 PM
State	Finished
Completed on	Wednesday, 13 December 2017, 9:58 PM
Time taken	2 mins 37 secs
Grade	**0.00** out of 106.00 (**0**%)

Question 1

Not answered

Mark 0.00 out of 2.00

Which of the following is true for an NPN BJT ?

Select one:

- a. Current flows when either Vbe or Vbc are negative voltages
- b. The base current consists of mostly electrons
- c. Current flows primarily because of electrons injected into the base
- d. An N-type base is sandwiched between a P-type emitter and a P-type collector
- e. All of these

The correct answer is: Current flows primarily because of electrons injected into the base

Question 2

Not answered

Mark 0.00 out of 2.00

Which of the following is true in modern bipolar junction transistors?

Select one:

- a. All of these
- b. The base doping is much higher than the emitter doping to minimize the number of carriers injected from the base into the emitter
- c. Carriers diffuse across the base and are collected by the emitter
- d. The base is kept wide to minimize recombination in the base
- e. The minority carrier concentration in the base decreases almost linearly from the emitter to the collector

The correct answer is: The minority carrier concentration in the base decreases almost linearly from the emitter to the collector

Question 3

Not answered

Mark 0.00 out of 2.00

An PNP BJT operating in the cutoff region has :

Select one:

- a. Vbe > 0 and Vbc < 0
- b. Vbe < 0 and Vbc < 0
- c. Vbe < 0 and Vbc > 0
- d. None of these
- e. Vbe > 0 and Vbc > 0

The correct answer is: Vbe > 0 and Vbc > 0

Question 4

Not answered

Mark 0.00 out of 2.00

For a BJT operating in saturation, which of the following is true?

Select one:

- a. The output resistance, ro , is much larger than in the forward-active region
- b. All of these
- c. The base-collector junction can be forward biased by about 400mV before the collector current starts to decrease
- d. The collector current increases linearly as the base current is increased
- e. The common-emitter current gain, β , is much larger than in the forward-active region

The correct answer is: The base-collector junction can be forward biased by about 400mV before the collector current starts to decrease

Question 5

Not answered

Mark 0.00 out of 2.00

If an NPN BJT at 300°K with a constant collector current of 1mA has a Vbe voltage of 780mV, then what will Vbe be for this same BJT if the collector current is decreased to 100μA?

Select one:

- a. 720mV
- b. None of these
- c. 780mV
- d. 660mV
- e. 840mV

The correct answer is: 720mV

Question 6

Not answered

Mark 0.00 out of 2.00

As |Vce| increases for a BJT in the forward active region, “base-width modulation” causes :

Select one:

- a. None of these
- b. The output resistance, ro , to increase
- c. The width of the base to increase
- d. The width of the base-collector depletion region to decrease
- e. The collector current for the BJT to decrease

The correct answer is: None of these

Question 7

Not answered

Mark 0.00 out of 2.00

Considering the typical input and output resistances, which of the following BJT amplifier types is well suited to be used as a voltage amplifier ?

Select one:

- a. Emitter-follower
- b. None of these
- c. Common-emitter
- d. All of these
- e. Common-base

The correct answer is: Emitter-follower

Question 8

Not answered

Mark 0.00 out of 2.00

For a BJT common-collector amplifier, which of the following is true ?

Select one:

- a. The voltage gain is negative
- b. The output resistance is typically high
- c. The voltage gain is typically high
- d. The input resistance is typically low
- e. None of these

The correct answer is: None of these

Question 9

Not answered

Mark 0.00 out of 2.00

For a MOS source-follower amplifier, which of the following is true ?

Select one:

- a. The drain is used by both the input and output ports
- b. The input signal is applied to the gate
- c. All of these
- d. NMOS and PMOS FETs use the same circuit topologies
- e. The output signal is measured at the source

The correct answer is: All of these

Question 10

Not answered

Mark 0.00 out of 2.00

For a MOS common-gate amplifier, which of the following is true ?

Select one:

- a. None of these
- b. NMOS and PMOS FETs use different circuit topologies
- c. The drain is used by both the input and output ports
- d. The output signal is measured at the source
- e. The input signal is applied to the gate

The correct answer is: None of these

Question 11

Not answered

Mark 0.00 out of 2.00

For a BJT each PN junction can be either forward or reverse biased, which gives 4 possible regions of operation.

Select one:

- True
- False

The correct answer is 'True'.

Question 12

Not answered

Mark 0.00 out of 2.00

If the base-emitter junction of a BJT is reverse biased and the base-collector junction is forward biased, then the BJT is operating in the reverse-active region of operation.

Select one:

- True
- False

The correct answer is 'True'.

Question 13

Not answered

Mark 0.00 out of 2.00

In the forward-active region the emitter current of an NPN BJT consists of holes injected from the emitter into the base and electrons injected from the base into the emitter.

Select one:

- True
- False

The correct answer is 'False'.

Question 14

Not answered

Mark 0.00 out of 2.00

As the Vce for a BJT increases, the width of the base decreases which causes the collector current to increase.

Select one:

- True
- False

The correct answer is 'True'.

Question 15

Not answered

Mark 0.00 out of 2.00

Voltage amplifiers need to have high input resistance and low output resistance.

Select one:

- True
- False

The correct answer is 'True'.

Question 16

Not answered

Mark 0.00 out of 2.00

When finding the resistance “looking into” a node, a voltage source Vx can be applied and the current, Ix, which flows in this source found. Then the resistance is equal to Ix/Vx.

Select one:

- True
- False

The correct answer is 'False'.

Question 17

Not answered

Mark 0.00 out of 2.00

The gain of a common-base BJT amplifier can be estimated by the ratio of the bias voltage across the collector resistor to the bias voltage across the emitter resistor.

Select one:

- True
- False

The correct answer is 'True'.

Question 18

Not answered

Mark 0.00 out of 2.00

All three BJT amplifier types (CE, CB, CC) are identical when the input and output are applied.

Select one:

- True
- False

The correct answer is 'False'.

Question 19

Not answered

Mark 0.00 out of 2.00

The gain of a common-gate MOSFET amplifier can be estimated by the ratio of the drain resistor to the source resistor.

Select one:

- True
- False

The correct answer is 'True'.

Question 20

Not answered

Mark 0.00 out of 2.00

Since current normally flows into the source of a NMOS FET, the source is usually drawn pointing up towards the positive power supply.

Select one:

- True
- False

The correct answer is 'False'.

Question 21

Not answered

Mark 0.00 out of 6.00

What is the open-circuit voltage gain, μf, in V/V for an PNP BJT operating in the forward-active region at 27° C with Ic = 859μA? Use: β = 18, VA = 65V and Vt = kT/q = 26mV.

Answer:

The correct answer is: 2500.00

Question 22

Not answered

Mark 0.00 out of 6.00

What is the output resistance, rds, in kΩ for an NMOS FET operating in saturation with Id = 835μA? Use: λ = 0.40

Answer:

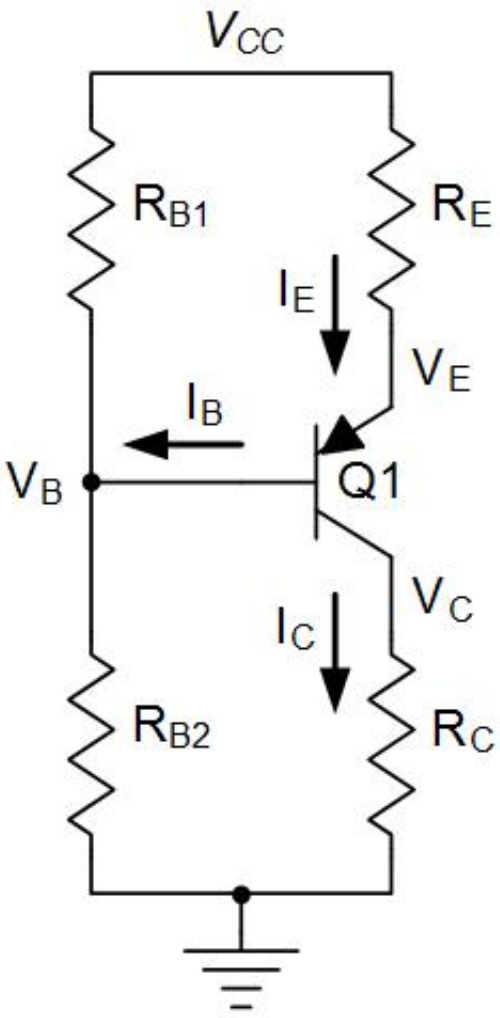
The correct answer is: 2.99

Question 23

Not answered

Mark 0.00 out of 6.00

For the BJT bias circuit shown, what is the collector current, Ic, in milliamps? Use Vcc = 12V, Rb1 = 27.5kΩ, Rb2 = 20.2kΩ, Rc = 1.1kΩ, and Re = 4.5kΩ. Assume that the transistor is in the forward-active region, with β = 35 and |Vbe(on)| = 0.7V. Neglect the effects of base-width modulation.



Answer:

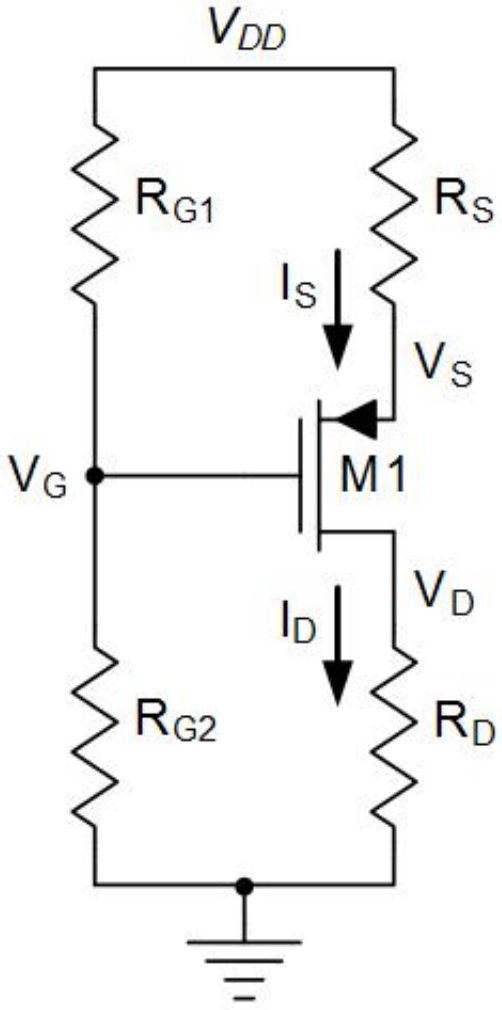
The correct answer is: 1.25

Question 24

Not answered

Mark 0.00 out of 6.00

For the MOSFET bias circuit shown, what is the source voltage, Vs, in Volts? Assume that the transistor is in the saturation region, and use: Vdd = 11V, Rg1 = 49.4kΩ, Rg2 = 56.2kΩ, Rd = 4.1kΩ, Rs = 9.7kΩ, Vt = -0.5V, and |Von| = 0.44. (Remember that |Von| = |Vov| = |Vgs|-|Vt|) Neglect the effect of channel-length modulation and body effect.



Answer:

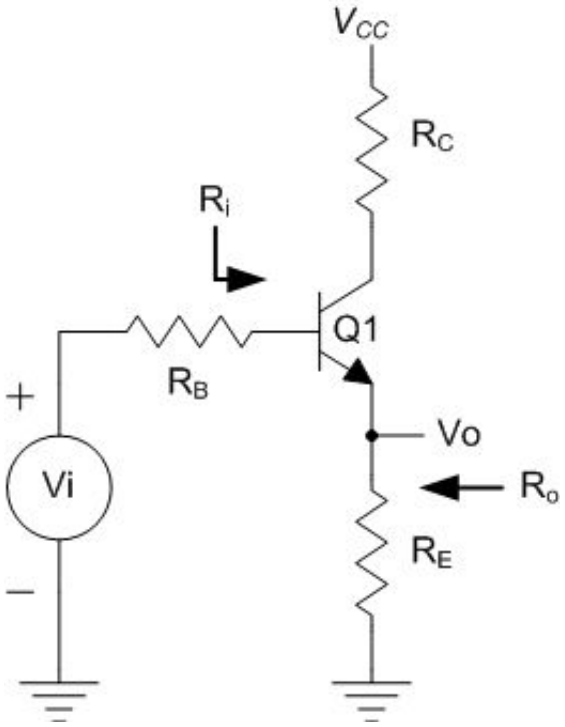
The correct answer is: 6.79

Question 25

Not answered

Mark 0.00 out of 6.00

What is the low frequency voltage gain for the amplifier shown at 27° C with Rc = 39.2kΩ, Re = 4.5kΩ and Rb = 0.3kΩ ? Use: Ic = 668μA, β = 74, and Vt = kT/q = 26mV. Neglect the effect of base-width modulation.



Answer:

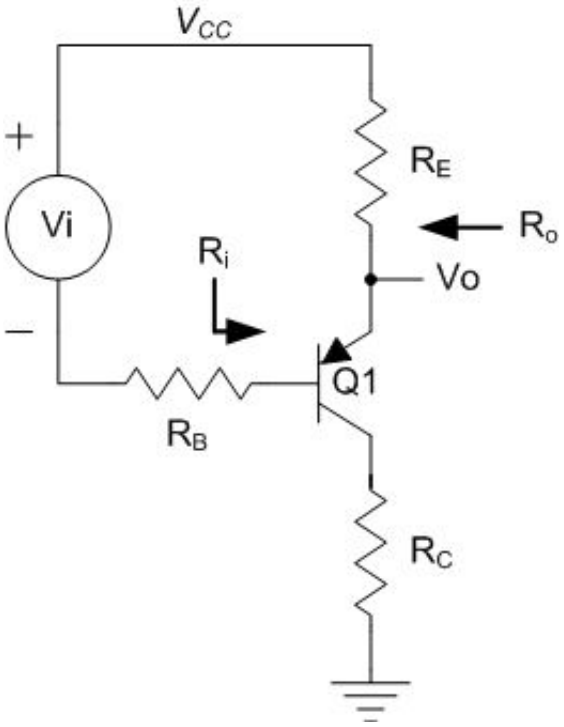
The correct answer is: 0.991

Question 26

Not answered

Mark 0.00 out of 6.00

What is the low frequency voltage gain for the amplifier shown at 27° C with Rc = 32.7kΩ, Re = 0.5kΩ and Rb = 0.8kΩ ? Use: Ic = 631μA, β = 50, and Vt = kT/q = 26mV. Neglect the effect of base-width modulation.



Answer:

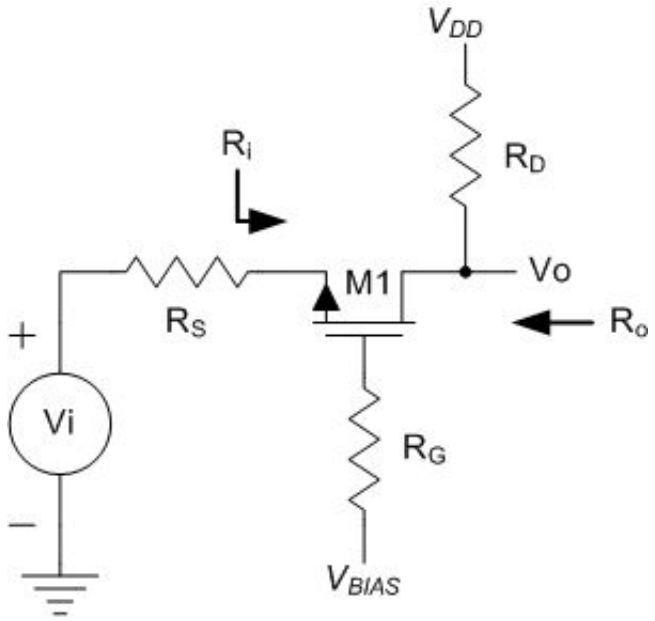
The correct answer is: 0.899

Question 27

Not answered

Mark 0.00 out of 6.00

What is the low frequency input resistance, Ri, in Ω for the amplifier shown at 27° C with Rd = 48.4kΩ, Rs = 10.0kΩ and Rg = 7.6kΩ ? Use: W/L = 95, Id = 509μA, VTN = 0.5V, k'n = 100μA/V^2. Neglect the effect of channel-length modulation and body effect.



Answer:

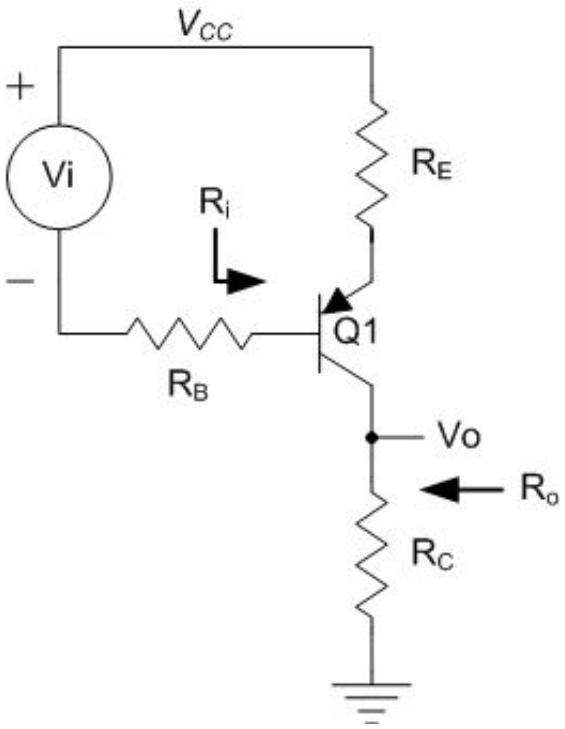
The correct answer is: 321.6

Question 28

Not answered

Mark 0.00 out of 6.00

What is the low frequency input resistance, Ri, in kΩ for the amplifier shown at 27° C with Rc = 44.3kΩ, Re = 4.3kΩ and Rb = 0.3kΩ ? Use: Ic = 449μA, β = 12, and Vt = kT/q = 26mV. Neglect the effect of base-width modulation.



Answer:

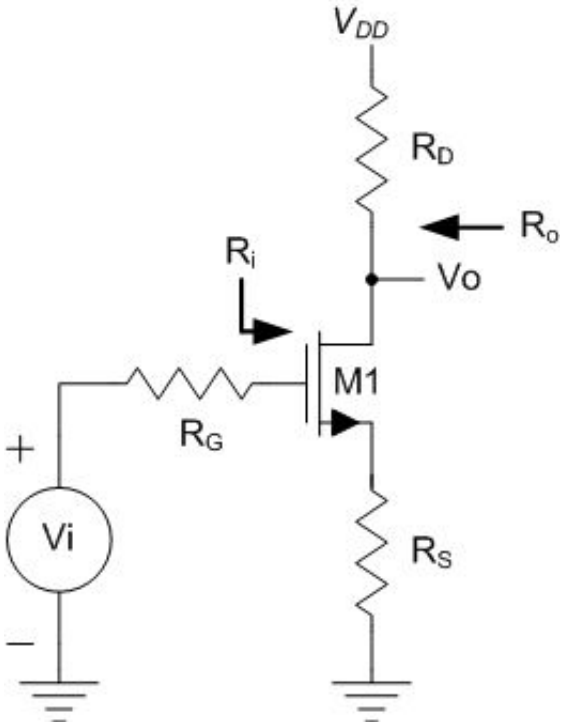
The correct answer is: 56.6

Question 29

Not answered

Mark 0.00 out of 6.00

What is the low frequency output resistance, Ro, in kΩ for the amplifier shown at 27° C with Rd = 37.2kΩ, Rs = 0.8kΩ and Rg = 2.9kΩ. Use: W/L = 16, Id = 482μA, VTN = 0.5V, k'n = 100μA/V^2, λ = 0.05 Neglect body effect.



Answer:

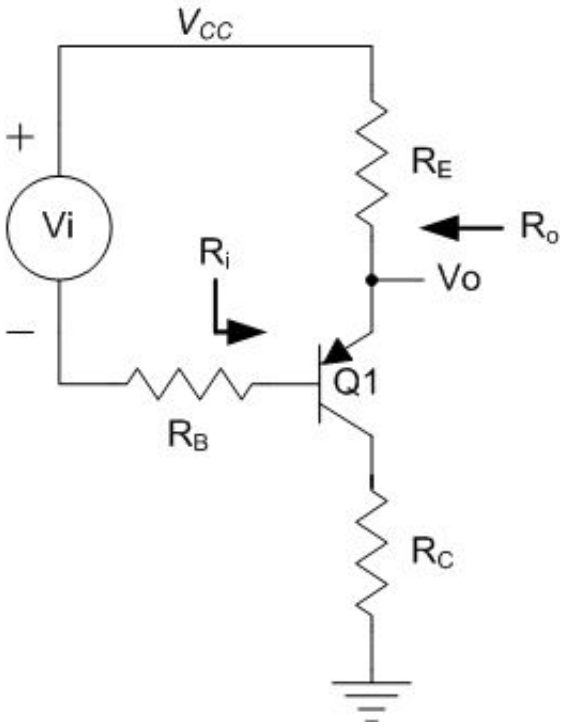
The correct answer is: 25.7

Question 30

Not answered

Mark 0.00 out of 6.00

What is the low frequency output resistance, Ro, in Ω for the amplifier shown at 27° C with Rc = 34.7kΩ, Re = 0.5kΩ and Rb = 0.8kΩ ? Use: Ic = 410μA, β = 10, and Vt = kT/q = 26mV. Use the "short-cut approach" discussed in class, and neglect the effect of base-width modulation.



Answer:

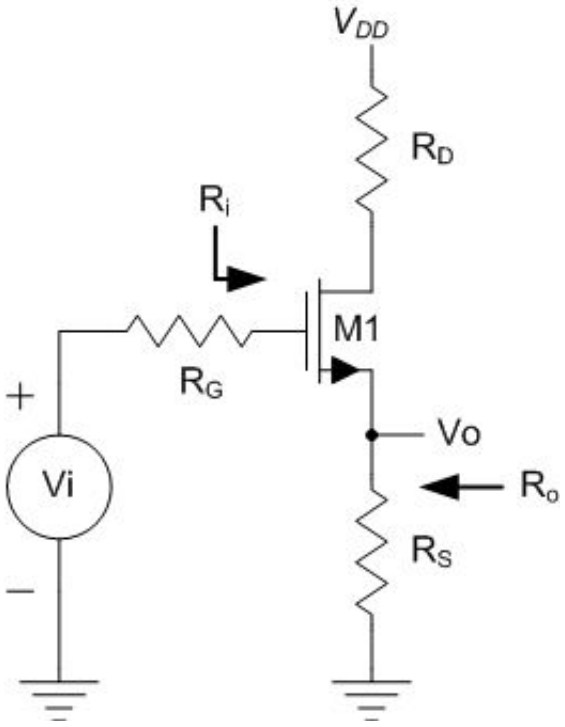
The correct answer is: 103.4

Question 31

Not answered

Mark 0.00 out of 6.00

Estimate the maximum low frequency voltage gain for the amplifier shown at 27° C with Rd = 42.4kΩ, Rs = 0.2kΩ and Rg = 2.0kΩ.



Answer:

The correct answer is: 1.000