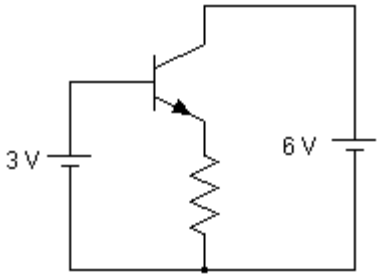
ELG3136B Quiz 1 -- Part A -- multiple choice.

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following is true for this BJT circuit? 1) _____



A) The base–emitter and collector–base junctions are both forward–biased.
B) The base–emitter and collector–base junctions are both reverse–biased.
C) The base–emitter junction is forward–biased and the collector–base junction is reversed–biased.
D) The base–emitter junction is reverse–biased and the collector–base junction is forward–biased.

2) Which of the following expressions is true? 2) _____

A) $\alpha_{dc}=\frac{\Delta I_C}{\Delta I_E}$ where V_{CB} is constant
B) $\alpha_{dc}=\frac{I_C}{I_E}$
C) $\alpha_{dc}=\frac{\Delta I_C}{\Delta I_B}$ where V_{CE} is constant
D) $\alpha_{dc}=\frac{I_C}{I_B}$

3) Which of the following expressions is true? 3) _____

A) $\beta_{dc}=\frac{I_C}{I_E}$
B) $\beta_{dc}=\frac{\Delta I_C}{\Delta I_E}$ where V_{CB} is constant
C) $\beta_{dc}=\frac{I_C}{I_B}$
D) $\beta_{dc}=\frac{\Delta I_C}{\Delta I_B}$ where V_{CE} is constant

4) In a small–signal transistor, the typical range of the parameter β is _____. 4) _____

A) large and in the range of about 50 to 400
B) greater than 100
C) between 0 and 100
D) almost equal to 100 but always less than 100 (90 to 100)

5) A BJT has measured dc current values of I_B = 0.1 mA and I_C = 8.0 mA. When I_B is varied by 100 μA, I_C changes by 10 mA. What is the value of the β_{ac} for this device? 5) _____

A) 10 B) 100 C) 800 D) 80

6) When a BJT is operating in the active region, the voltage drop from the base to the emitter V_{BE} is approximately equal to the _____. 6) _____

A) emitter voltage
B) base bias voltage
C) diode drop (about 0.7 V)
D) base current times the base resistor

7) When a BJT is operating in the saturation region the voltage drop from the collector to the emitter V_{CE} is approximately equal to _____. 7) _____

A) the collector current times the collector resistor
B) the emitter voltage
C) the collector supply voltage
D) zero (about 0.3 Volts)

8) A given BJT has an emitter current of 15 mA and a collector current of 14.95 mA. What is the exact value of β? 8) _____

A) 1.003 B) 300 C) 299 D) 250

9) Which transistor amplifier configuration is the most commonly used? 9) _____

A) common–collector
B) common–base
C) common–emitter
D) None of these are used more often than the others.

10) A(n) _____ configuration ties the collector of one transistor to the emitter of a second transistor. 10) _____

A) Miller B) cascade C) cascode D) direct coupled

11) The main benefit of a direct–coupled amplifier is _____. 11) _____

A) increased input impedance B) improved low–frequency response
C) improved high–frequency response D) all of the above

12) Depending on the configuration of the amplifier, the magnitude of the no–load voltage gain for a single BJT transistor amplifier typically ranges from _____. 12) _____

A) 10 to about 10,000 B) just a little less than 1 to a few hundred
C) a hundred to about a million D) None of the above

13) The common–emitter amplifier has _____. 13) _____

A) voltage gain, current gain, and power gain
B) current gain and power gain, but no voltage gain
C) current gain and voltage gain, but no power gain
D) voltage gain and power gain, but no current gain

14) A common–emitter amplifier with voltage divider bias and a bypassed emitter resistance has values of $R_C = 10\ k\Omega$, $r_e = 25\ \Omega$, and $h_{FE} = 150$. What is the value of the voltage gain for the circuit? 14) _____

A) 400
B) 3750
C) 60,000
D) Cannot be determined with the information given

15) The common mode rejection ratio (CMRR) is the ratio of _____. 15) _____

A) noninverting gain to inverting gain
B) inverting gain to noninverting gain
C) the difference mode gain to the common mode gain
D) the common mode gain to the difference mode gain